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CONTENTS.

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No. 1. *July.*

	PAGE
Anniversary Address, 1898. By the President	1
The Fourth Centenary of Vasco da Gama's Voyage to India. By the President	10
The 'Roteiro' of Da Gama's Voyage	20
The Geography and Resources of the Yukon Basin. By William Ogilvie	21
Exploration in the Yafei and Fadhli Countries. By Mrs. Theodore Bent	41
Notes on the Visit of Dr. Bach to the Catuquinarú Indians. By Colonel G. E. Church	63
Sir Archibald Geikie on Scenery and Literature	68
Admiralty Surveys during the year 1897	70
The Anglo-French Boundaries in West Africa. By E. G. Ravenstein	73
The Monthly Record	75
Obituary of the Year	85
Meetings of the Royal Geographical Society	86
Geographical Literature of the Month	90
New Maps	107

MAPS AND ILLUSTRATIONS—

Looking Northward and Landward from Peninsula between Chilkat and Chilkoot Inlets	22
Looking North-west across Dyea and Chilkoot Inlets	23
Looking down Cañon from Head	25
Looking down "White Horse" Rapids	26
Site of "Dawson," April, 1897	27
Looking up Yukon River from near Dawson	29
Looking across Bonanza, and up Eldorado Creeks	31
Junction of Yukon and Forty-mile Rivers, with Town of Forty-mile between	32
Confluence of Forty-mile River with Yukon	33
Looking up Cañon on Forty-mile River	35
Looking North across Yukon River at 141st Meridian	37
The Haghier Mountains, from Suk, Sokotra	42
Looking over the Pass toward Adahan, Sokotra	43
From Jebel Sarrar, looking North-east	46
House and Oven, Dirgheg, Behd Fadhli	47
View from above Wadi Yeramis	50
From Yerad, near Naab, looking North-east	51
From Haidejebus. From Haidenaab	52
Sheikh Seil and Sultan Haidan	53
From Haidenaab, looking North-west	54
Old Naab, showing where Wadi Reban goes on from Wadi Yeranus	55
Wadi Ghinda, looking East	56
From Camp between Akaba Beva and Akaba Sauda	57
Wadi Ghinda, looking East	58
From Mishal, looking South	59

PAGE

Fadhli at Shareah, Wadi Reban 60
From above Bir Lammas, looking North-west 61
From Wadi Samluf 62
Telegraph of the Catuquinarú Indians 65
Anglo-French Boundaries in West Africa 74
Map of the North-western Part of the Dominion of Canada 112
Map of the Fadhli Country, South Arabia 112

No. 2. *August.*

On the Annual Range of Temperature in the Surface Waters of the Ocean, and its Relation to Other Oceanographical Phenomena. By Sir John Murray, K.C.B., F.R.S., LL.D., D.SC. 113
An Exploration in 1897 of Some of the Glaciers of Spitsbergen. By Sir W. Martin Conway 137
Mr. Frazer's Pausanias. By the Rev. H. F. Tozer 158
Proposal for an Expedition to Sannikoff Land. By Baron E. von Toll 162
Russian Navigators in the Arctic Ocean in 1895–96. Communicated by Colonel J. Shokalsky 172
United States Daily Atmospheric Survey. By Willis L. Moore 176
Persian Gulf Notes. By Captain A. W. Stiffe, R.I.M. 179
Areas of North American and Australian River-basins 182
The Glaciers of Russia in 1896 184
The Monthly Record 186
Obituary 195
Meetings of the Royal Geographical Society 201
Geographical Literature of the Month 202
New Maps 221

MAPS AND ILLUSTRATIONS—

Fig. 1.—South Face of Highway Dome 143
Fig. 2.—Diagram illustrative of Cliff Disintegration 144
Fig. 3.—The Three Crowns, King's Glacier 152
Fig. 4.—The Summit of the King's Highway 153
Fig. 5.—Highway Dome, King James Land 153
Fig. 6.—King's Glacier and Bay 154
Fig. 7.—The Last Camp near Mount Cheldenius 154
Fig. 8.—Nordenskiöld Glacier Camp 155
Sketch-Map of Kharag Island 180
Tomb of Mir Muhammad 181
Major-General R. G. Woodthorpe, C.B., R.E. 197
Map of the Annual Range of the Surface Temperature of the Ocean .. 224
Map of Central Spitsbergen 224
Chart showing Changes of the Coast at the Entrance of the Obi and Yenisei Rivers 224

No. 3. *September.*

The Yangtse Chiang. By W. R. Carles, H.B.M. Consul at Swatau 225
Circumnavigation of Lake Bangweolo. By Poulett Weatherley 241
Through Tibet to China. By Captain H. S. Wellby, 18th Hussars 262
A Visit to Karaginski Island, Kamchatka. By G. E. H. Barrett-Hamilton and H. O. Jones 280
African Books of 1897-98. By Edward Heawood, M.A. 300
The Old Beds of the Amu-Daria. By P. Kropotkin 306
The Monthly Record 310
Geographical Literature of the Month 320
New Maps 332

MAPS AND ILLUSTRATIONS—

Sketch-Map of Cheng Tu Plain 232
Swamp near Lifunga 244
Lake Mwero 245

PAGE

View of Kilwa Island 247
Lake Bangweolo 249
View of the Luapula 251
Johnston Falls 253
Village near Kisi 255
Ladies at Chienje 257
Coast of Kamchatka and Karaginski Island 281
Part of Karaga Village, with Balagan in Foreground 283
A Balagan at Karaga Village 285
A Family Party at Karaga Village 287
A Yurt and Family Party at Karaga Village 289
Natives of Karaga Village on board H.M.S. *Linnet* 291
A Balagan on Karaginski Island 293
Type of Inhabitant of Karaginski Island 295
Natives of Karaginski Island on board H.M.S. *Linnet* 297
Sketch-Map of Hongkong and Neighbourhood 312
Sketch-Map illustrating M. Foa's Journeys in British Central Africa .. 314
Sketch-Map of Central China 336
Map of Lake Bangweolo and Surrounding Country 336
Sketch-Map of Tibet and Northern China 336
Geological Map of the Transcaspian Depression 336

No. 4. *October.*

Tirah. By Colonel Sir T. H. Holdich, R.E., K.C.I.E., C.B. 337
Kavirondo. By C. W. Hobley 361
Nordenskjöld's 'Periplus.' By C. Raymond Beazley 373
Geography at the British Association, Bristol, 1898 377
The Swedish Arctic Expedition 385
Argentine Geography and the Ancient Pampean Sea. By Colonel George Earl Church 386
A Great Globe. By Prof. Élisée Reclus 401
The Monthly Record 409
Geographical Literature of the Month 424
New Maps 442

MAPS AND ILLUSTRATIONS—

A Camp in Tirah 339
Road-making 341
Completed Road 343
General View of Terraced Country 345
Terraces in Maidán 347
Tirah Villages 348
Maidán Terracing 349
Houses in Maidán 351
Near Arhanga Pass 353
Mountain Scenery, Tirah 355
Sketch-Map of Tirah and surrounding Country 444
Map of Kavirondo 444
A Railway Map of the Argentine Republic 444
Map to illustrate "Argentine Geography and the Ancient Pampean Sea," together with Railway Sections 444

No. 5. *November.*

Oceanography of the North Atlantic. By Albert Prince of Monaco 445
Exploration on and around Aconcagua. By E. A. Fitz Gerald 469
The German Deep-sea Expedition 494
Dr. Thoroddsen's Exploration in Iceland, 1898 496
Peary's 'Northward over the Great Ice' 498
The Resources and Means of Communication of China. By Geo. G. Chisholm, M.A., B.SC. 500

PAGE
The Monthly Record 519
Obituary 530
Correspondence 534
Geographical Literature of the Month 536
New Maps 548

MAPS AND ILLUSTRATIONS—
Current Floats or Bottles 447
Bottom Dredge 457
Polyhedric Trap and Buoy 458
Trap, Buoy, and Float 460
Symenchelys Parasiticus, Gill 461
Chiroteuthis Grimaldii, Joubin 463
Neolithodes Grimaldii, M. Edwards and H. Bouvier; Surface Dredge .. 466
Aconcagua from the East 471
South-east Precipice of Aconcagua 473
Horcones Valley 477
Seracs Horcones Glacier, North-west Slopes of Aconcagua 479
The Penitentes 481
Tupungato, 30 miles distant 482
Tupungato Valley 483
Stone Circles at Lamin Koto and Chamen 522
Sacred Stones on the Gambia 523
Sketch-Map to illustrate the Route of the Fitz Gerald Expedition to Aconcagua 552
Sketch-Map of China and Adjoining Regions 552
Sections of China 552

No. 6. *December.*

The Glaciers of North America. By Prof. Israel C. Russell, University of Michigan 553
The Environs and Native Names of Mount Everest. By Major L. A. Waddell, LL.D., I.M.S. 564
Oceanographical Expeditions—
I. The German Deep-Sea Expedition 569
II. The Austro-Hungarian Expedition to the Red Sea 571
Ball's 'Alpine Guide.' New Edition 573
The Crawford Mappemonde Reproductions. By C. Raymond Beazley, M.A. 575
Map of Lake Nyasa and the Upper Shire River. By Alfred Sharpe, C.B. .. 580
The Influence of Geographical Conditions on Social Development. By Prof. Patrick Geddes 580
Mr. Savage Landor's Travels in Tibet.—A Review. By Colonel Sir T. H. Holdich, K.C.I.E., C.B., R.E. 587
Acclimatization of Europeans in Tropical Lands. By Dr. L. Westenra Sambon 589
Survey of India Report 606
The Monthly Record 607
Obituary 620
Correspondence 622
Meetings of the Royal Geographical Society 623
Geographical Literature of the Month 623
New Maps 643
MAPS AND ILLUSTRATIONS—
Tibetan Picture Map of Mount Everest Range 568
Sketch-Map of the Bahr-el-Ghazal and Upper Ubangi 610
Map of Lake Nyasa 648

The

Geographical Journal.

66577.

No. 1. JULY, 1898. Vol. XII.

ANNIVERSARY ADDRESS, 1898.*

By the PRESIDENT.

Since I last addressed you at the beginning of the present session, much has happened of geographical interest. I informed you then that an appeal on behalf of a Government antarctic expedition had been made to Lord Salisbury. I may state that a reply was received from the Prime Minister's Private Secretary, with a promise that in the course of a few months we should hear further on the subject. Meantime the movement in favour of a British antarctic expedition has not stood still. A meeting of very great interest was held in the beginning of the year at the Royal Society, in which eminent authorities in various departments of science and of various nationalities met to discuss the subject. They were unanimous in insisting on the necessity of renewing antarctic exploration, and on the duty of the British Government to take a substantial share in it. The Germans themselves have been active in this direction. A German expedition is at this moment being organized on a liberal scale, and funds are being collected throughout Germany for the purpose. It would be a matter of prime importance if it could be arranged that a British expedition should take the field at the same time as the German expedition, and that all should work on a common plan, so as to ensure the best results. Moreover, there is reason to hope that the Norwegian Government might send out an expedition also, perhaps under the leadership of Dr. Nansen, to carry out exploration mainly on land. Meanwhile the Belgian expedition, under M. de Gerlache, has been actively engaged in carrying out the work for which it was organized. The expedition,

* Read at the Anniversary Meeting of the Society, May 23, 1898.

liberally supported by Sir George Newnes, under Mr. Borchgrevink is, I believe, in an advanced state of preparation.

With regard to the arctic regions, we have recently had three important meetings dealing with the subject. The session opened with a paper by Mr. Jackson on the Jackson-Harmsworth expedition to Franz Josef Land, and from what we heard from Mr. Jackson himself and from his four companions, we have reason to hope that when the full account of this expedition is given to the world, it will be evident that it has made an important and substantial contribution to our knowledge of arctic conditions. Lieut. Peary has at last been able to tell us in person of his expeditions to Northern Greenland, and these have been considered so important that the Council have awarded him a Royal Medal. Lieut. Peary was to have proceeded to Northern Greenland again this summer for the purpose, among other things, of making an attempt to reach the pole, on a plan which he has carefully considered. Unfortunately, the war which has broken out between Spain and the United States may compel Lieut. Peary, as a naval officer, to remain at his post of duty. Let us hope that his departure has only been postponed for a short period. Captain Sverdrup has announced his intention of proceeding to the same part of the arctic regions, his main object being to lay down, if possible, the unknown north and north-east coast of Greenland.

I need only recall the excellent account given at one of our meetings by Colonel Feilden, of the visit of himself and Mr. Pearson last summer to Novaya Zemlya, and the remarkably open sea found in that quarter. Mr. Arnold Pike told us that he found it equally open off the east coast of Spitsbergen, as did the walrus hunters who visited Franz Josef Land about the same time. Sir Martin Conway again visited Spitsbergen during the summer, and, in conjunction with Mr. Garwood, made important contributions to our knowledge of the physical geography of the interior of the main island. We know of two important expeditions proceeding to the same portion of the arctic regions this summer—a Swedish expedition under Dr. Nathorst, and a German expedition, the object of both being to examine the seas in the neighbourhood of Spitsbergen and Franz Josef Land.

Germany indeed is setting an admirable example in scientific exploration. Besides the antarctic expedition referred to, the German Government has made a grant of £15,000 for oceanic research, especially in the Atlantic and Indian oceans. In the North Atlantic much good work was done under the joint co-operation of the Swedish, Norwegian, German, and British governments. The minister for Sweden and Norway, in London, has, by instruction from his Government, brought the subject under the notice of our Foreign Office, with a view to a renewal of their joint work. How important it is even from the practical point of view, has been strikingly shown by Prof. Pettersson, the

distinguished oceanographer, who demonstrates that an adequate knowledge of temperatures, salinity, etc., at various depths, is absolutely essential to a successful prosecution of deep-sea fishing, as on them to a large extent depends the migration of the fish, both horizontally and vertically. And even more important he shows that on these conditions the weather of Western Europe also depends, and by their study the accuracy of weather forecasts can be increased. It is to be hoped our Government will see it to be its duty and its interest to join in a work which so nearly concerns an important national industry.

The scientific value of oceanographic research was strikingly illustrated in the valuable paper so recently contributed to the Society by the Prince of Monaco. Not less important was the remarkable paper by Sir John Murray, on the distribution of surface temperatures in the ocean and its bearings on oceanographical problems.

Before quitting the polar regions, I must express a hope that during the coming summer we may receive authentic information concerning the hazardous balloon expedition undertaken by Mr. Andrée, and that the information may be such as will satisfy us of his safety.

One of the most remarkable papers of the session, and indeed of any session, was that of Dr. Sven Hedin concerning his three years' explorations in Central Asia. I am sure you will agree with me that the great work accomplished by him richly deserves the many honours he has received since his return. Of Mr. Savage Landor's hazardous attempt to reach Lhasa we expect to have a full account shortly, and there is good reason to hope that the sufferings he underwent will not be without some compensation in the contributions which Mr. Landor has been able to make to the geography of Southern Tibet.

The trying campaign on the north-west border of India, which had to be carried on during the past year under my old friend Sir William Lockhart, was rendered still more difficult by our absolute ignorance of the geography of the greater portion of the region concerned. One good result of the campaign has been a substantial addition to our knowledge of the geography of this complex mountain region. The force was accompanied by a survey party under Colonel Sir Thomas Hungerford Holdich, and he has presented a valuable paper to the Society, with maps and photographs, which I am sure will be read with interest. It is hoped that Sir Thomas Holdich will be able to read it at one of our evening meetings before the close of the session. Captain Deasy has written to the Society from Yarkand, which he has reached, after doing some useful exploring work *en route*. He has discovered that the Yarkand river is very inaccurately laid down on our maps, and he proposes to devote several months to exploring the country around Yarkand, including the Takla Makan desert. Captain Pottinger has returned to England from his unsuccessful attempt to solve the problem of the great rivers that come from Tibet south through the Indo-Chinese peninsula. Although compelled

to abandon his expedition, he succeeded in traversing some unknown country on the Upper Mekong, and we may expect to have some account of his journey from himself. Further south, we have had another interesting paper from Mr. Warington Smyth, on his journeys in Siam; this time in the little-known East Coast States. He has just given to the world, in book form, a full account of all his journeys, which will show that he well deserves the award which the Council have made him.

We were all of us greatly interested in Mr. Cavendish's account of his journey in Somaliland, and cannot but regret that circumstances have prevented his undertaking another expedition, in which he hoped to strike across that difficult country lying between Somaliland and the Upper Nile, of which we know almost nothing. It is a country which several young explorers are longing to attack, and it is to be hoped that England will have the honour of opening up one of the few remaining regions in Africa that still await the pioneer. One of these young explorers, Mr. Jennings Bramley, recently made an attempt to penetrate southwards to the Central Sudan from Cairo. Unfortunately, he was compelled to turn back, though there is reason to hope that he may resume the hazardous attempt—let us hope, this time with success. It will be remembered that Mr. Bramley recently contributed an interesting paper to the *Journal* on his visit to the oasis of Siwa, from which another young Englishman, Mr. Silva White, has just returned, after having made some interesting archæological discoveries. Mr. White had intended to push on to the headquarters of the Senussi, in the south of Tripoli; but, as might have been expected, he found this impossible. A French explorer, M. Foa, a Fellow of our Society, has recently completed an interesting journey, lasting about three years, across Africa, from the Zambezi to the mouth of the Congo. Though his object was mainly sport, he visited one or two almost unknown regions, concerning which he has, no doubt, brought back welcome information. Major Gibbons, from whom we had a valuable paper last session on the Barotse country, has again just started, at the head of a well-equipped expedition, to further explore this region, and to continue northwards to Lakes Bangweolo and Tanganyika. Of Lake Bangweolo Mr. Poulett Weatherley has made a very complete examination, and has circumnavigated it. He has been in this region for about three years, and, from the voluminous letters which he has sent home, a paper has been prepared, giving an account of his work, which will be communicated to the Society next month. His very numerous whole-plate photographs are much above the average of photographs taken under similar circumstances. The subjects have been selected with unusual discrimination, and afford an impressive conception of the country in which he is sojourning. Mr. Alfred Sharpe, H.M. Commissioner in the British Central African Protectorate, has brought home with him an excellent

map of the Protectorate, which has been the work of several years, and which, it is hoped, the Society may be able to publish at an early date.

From America we have had two papers during the past session of unusual interest. We were all glad to listen to Mr. William Ogilvie's account of the Yukon region, in which, in connection with the Klondike gold discoveries, so much interest at present centres. Mr. Ogilvie, we know, is the one trustworthy and competent authority on this country, and the very accurate information he was able to give on the geography of the country cannot but be of great practical value. The Canadian Government expedition to Hudson's Bay, whatever may be the practical results as to navigation, has made a very important contribution to our knowledge of the shores of the bay and of its ice-conditions. The complete report has only just been issued. Mr. Fitz Gerald's graphic account of the explorations accomplished by his expedition in and around Aconcagua, entitles him to take a high place among what may be called high-level geographers. Amid many difficulties and discouragements, he and his companions succeeded in making an accurate detailed survey of a region of great interest to the physical geographer —a region of which his splendid photographs afford a wonderfully clear conception. It is such detailed study of limited regions that geographers now desire more than anything else. Mr. Pratt, who some years ago did good work on the Tibetan border, has just returned from an expedition to the western portion of the republic of Columbia, during which he visited some districts almost unknown; while Major Stanley Paterson, amid many difficulties, succeeded in penetrating into an unvisited portion of Northern Venezuela.

From Australia we had recently a paper of much interest by another young explorer, Mr. David Carnegie. It was a carefully planned and successfully carried out expedition, and was of special importance in that it crossed, in a north and south direction, the routes of various previous explorers, running in an east and west direction.

These are some of the principal subjects that have been brought before us at the ordinary evening meetings of the Society. But besides these we have had special afternoon meetings, in which important subjects in scientific geography have been discussed by specialists. Mr. Vaughan Cornish's very able paper, describing his researches on sea-beaches and sandbanks, gave rise to a most interesting discussion by men specially competent to deal with the subject. Equally important and equally interesting in its way was Dr. Sambon's paper on the possibility of European acclimatization in tropical countries. The vast importance of this subject is evident to all, and whatever may be thought of the position maintained by Dr. Sambon and Dr. Manson, it will be agreed that the subject is one that deserves the closest investigation and discussion by competent specialists. Not less suggestive and interesting

will be the paper by Prof. Geddes, to be given in a day or two on "The Influence of Geographical Conditions on Social Development."

All this will show how very varied are the subjects which come under the consideration of the Society, and how wide is the conception which it entertains of the field of geography. That conception is widening more and more in this country, and if thoroughly trained and competent young men are encouraged to devote themselves to the various sections of our wide subject, the results cannot but be of the greatest benefit to our science.

During the year the great work of cataloguing, according to subjects or localities, the whole of the contents of the library has been carried forward steadily by the librarian and Mr. Heawood. More than 80,000 title-cards have been prepared; and the end of the collection of these titles may now be said to be in sight. Already the 15,000 bound books and the 7000 pamphlets have been catalogued, and 7000 of the 9000 volumes of bound geographical publications have been carefully looked through, and the titles of all important papers they contain copied out on cards to the number of 58,000. In the case of the Russian, Hungarian, and other little-known languages, a translation of the title in English is also given. There remain about 2000 volumes of publications to be discussed, and these will probably require about ten cards per volume on the average, or a total of 20,000 additional titles. At the present rate of progress, rather less than ten months will be required for the collection of titles, and the whole set will then number about 100,000.

The classification is now so far advanced that it can proceed as rapidly as the preparation of the cards admits, so that no delay will arise on that account. After the collection is complete, a certain number of the cards must be duplicated for classification under different headings, and then there will be the question of printing to consider. This is not, however, an urgent question, as the utility of the work in the Society is greater in the form of a card catalogue than it would be in the form of volumes.

A natural difficulty which presents itself in any work of the kind is that, once completed, it soon falls out of date, and supplements have to be compiled with great labour. In the present case that has been entirely overcome. For the last six years every accession to the library —be it book, pamphlet, or paper—has been recorded in the *Geographical Journal*, and the titles, month by month (now averaging 200), have been pasted on cards and classified. The catalogue is thus automatically kept up to date as part of the ordinary routine of library work, and this catalogue of the most recent, and usually the most important geographical publications, is at present kept fully classified in 26 boxes, with 420 separate subdivisions.

The classification of geography has been carefully studied by Dr.

Mill, who has explained the principles to be followed and given a statement of the provisional subdivisions adopted for the catalogue in the February number of the *Journal*. The experience acquired in the preparation of the subject catalogue has enabled the Society to render help to the Royal Society in its magnificent project of an international subject catalogue of scientific literature, the successful inauguration of which promises to be a worthy tribute to the beginning of the coming century.

The library continues to be the scene of considerable activity in geographical study both for fellows and foreign visitors, and with its increasing usefulness the unsuitable nature of its housing becomes even more apparent. While the introduction of the electric light has stopped the destruction of bindings due to burning gas, the small rooms and many open fires throughout the house subject the books to the scarcely less disagreeable effects of sooty dust, and to the ever-present risk of fire. Only a new building planned for the accommodation of our unique geographical library and fitted with the safeguards that experience has shown to be necessary can overcome these inconveniences.

The most notable geographical publications of the past year have perhaps been in the department of historical geography; and it is with no little satisfaction that we recognize the profound and scholarly research of one of our own fellows, Mr. J. G. Frazer of Trinity College, Cambridge, whose translation and discussion of Pausanias's "Geography of Greece," in five goodly volumes, shows that this country can still claim a leading place in the production of works of the first importance. Baron Nordenskiöld's "Periplus" is another example of the rich results which reward the study of the historical aspect of our science.

On the physical side of geography we must recognize the enterprise of the Berlin Geographical Society in publishing the superb record of Dr. von Drygalski's work on the glaciers of Greenland. French geographers also deserve our congratulations on M. Delebecque's fine work on the lakes of France; and perhaps they incur our just envy on account of the graceful and accurate translation of Suess's classical treatise, "Das Antlitz der Erde," under the charge of M. le Margerie. The lack of translations of the masterpieces of foreign geographers is a reproach to the English language and to British publishers. Prof. Ratzel has shown, in his recently published "Politische Geographie," how great is the tribute which scientific geography may pay to practical life and political methods.

Among English publications, Mrs. Bishop's admirable book on Korea deserves special recognition; and the study of our own island has been greatly promoted by the publication of the complete geological map of England on a scale of 4 miles to the inch by the Geological Survey, and of Sir Archibald Geikie's geological map of England on the scale of 10 miles to the inch by Mr. Bartholomew, a masterpiece of colour-printing.

The cause of geographical education has been furthered by the presentation at the Toronto meeting of the British Association of a report drawn up by Mr. Herbertson for a committee on the present condition of geographical education in the United Kingdom. It is a valuable supplement to Dr. Keltie's report prepared for the Society in 1884, and shows much progress, if not enough to satisfy those who have the improvement of education at heart.

Both at Oxford and Cambridge geography continues to improve its position. As you know, at Oxford the University bears the entire expense of the readership. After long and careful consideration, the Council decided to continue the Society's contribution to the Cambridge lectureship, on the understanding that the University would take it over at the end of five years, and that the lecturership would be elevated to a readership. The reader, Mr. Yule Oldham, sends the following report of the work during the past year:—

"The marked advance which was made last year has been well maintained. I have again lectured on the geography of Europe for historical students and on physical geography for geological students to good classes, while a special lecture on the north-west frontier of India attracted an audience of over a hundred. For the University Extension Scheme I have given a considerable number of lectures, notably courses of twelve lectures at Leicester and twenty-four at Cambridge, which were largely attended and led to much excellent work.

"In the region of examinations, progress has again been made. Last summer, for the first time, geography was included as a special group in the Higher Locals; steps are now under consideration for the purpose of giving greater prominence to physical geography in the Senior and Junior Locals, while a large number of colleges here have agreed to make physical geography a subject for their science scholarships.

"The period of five years for which I was appointed Lecturer in Geography ends with this summer, but the work initiated and supported by the Society has not been fruitless. In place of a lectureship, the University has established a readership in geography, an office of greater position, permanence, responsibility, and opportunities, to which I have been appointed. As reader, I shall have seats on the special Boards for Geology and for History, and I anticipate better opportunities for advancing the interests of geography."

With regard to Oxford, Mr. Mackinder writes: "During the Michaelmas Term I lectured twice a week, to 40 men from 13 colleges, and 13 ladies from 3 colleges. During the Hilary Term, I lectured to 53 men from 12 colleges, and 12 ladies from 3 colleges. During the Summer Term I have given no public lectures; but, at the invitation of 3 different colleges, I have given 3 courses of private lectures, in each case to about 20 men. This is a considerable development of similar work undertaken for the first time—on a smaller scale—last year.

"At Gresham College I have delivered my usual course of 25 lectures. It has been steadily attended by 220 persons, of whom 140 wrote weekly essays for my assistant, Mr. A. W. Andrews, M.A., of Magdalen College, Oxford, and 120 earned the Sessional Certificate of the London University Extension Society in Examinations conducted by Mr. A. J. Herbertson, of the Heriot Watt College, Edinburgh. The fact that many teachers come to the lectures session after session is worthy of note. One case, indeed, has been brought to my knowledge of a teacher who has attended these geographical courses for seven successive years, and several have attended for four."

The measures adopted by the Council last year for increasing the efficiency and extending the scope of the system of instruction conducted by Mr. Coles, have quite fulfilled our expectations. Our diploma is granted to those pupils who pass a satisfactory examination before a committee composed of two members of our Council and of Mr. Coles. The examination consists of observations for latitude and longitude, adjustment of instruments and computations, azimuth observations, surveyings with prismatic compass, tachometers, and plane-table, plottings from the field-book, and map-projection.

Last year (1896–97) forty-one intending travellers received instruction from Mr. Coles, one of whom was granted the Society's diploma. In the present year (1897–98) sixty-five intending travellers have received instruction, being an increase of twenty-five, and five of these have passed before the committee and received diplomas, one of them being a lieutenant in the navy. Among the pupils there were twenty-six civilians, twenty-four officers of the army and navy, four in the colonial service, four civil engineers, and two missionaries.

The Society owes much to Mr. Coles for the pains and trouble he has taken, and for the time he has devoted to the work of teaching; often working with his pupils until late at night, and looking over their work early in the morning. He has made his system of instruction a great success, and it is certainly one of the most important branches of the work of our Society. From year to year we shall increase the number of well-trained explorers and travellers, and the work that is sent home to us will proportionally increase in value.

This year we have reached and passed the four-thousandth figure in the number of our Fellows. This is a landmark in our progress; while the most notable events in our history this year are the grant of diplomas and the creation of a growing number of trained scientific explorers.

THE FOURTH CENTENARY OF VASCO DA GAMA'S VOYAGE TO INDIA.

On May 16, a special meeting of the Society was held in commemoration of the fourth centenary of Vasco da Gama's discovery of the Cape route to India. The President, Sir Clements Markham, was in the chair, and the meeting was honoured by the presence of their Royal Highnesses the Prince of Wales and the Duke of York. Senhor A. de Castro, the *chargé d'affaires* of Portugal, was also present as representative of his country. The President addressed the meeting as follows :—

VASCO DA GAMA.

By the PRESIDENT.

We are assembled this evening to commemorate one of the greatest events in the history of the world—the discovery of the ocean route to India by the Portuguese. Vasco da Gama completed the mighty enterprise on the day when the ghâts of India were sighted from the deck of his ship just four hundred years ago to-morrow. The credit of this discovery is due to the Portuguese people, to their constancy and heroic perseverance, even more than to the skill and ability of their leaders; and I think that many of the illustrious navigators of Portugal are equal in merit, and should be equal in renown. We contemplate the perseverance of this people and the continuity of their work during a century and a half of mighty effort, rather than a single stroke of genius. Yet it is right that Vasco da Gama, who forged the last link, should have the first place which Camoens has assigned to him, *primus inter pares*.

Prince Henry gave the first impetus, and during a quarter of a century he created a school of seamen who rounded Cape Bojador in 1435, Cape Blanco in 1443, Cape Verde in 1445, and reached the Gambia in 1454. All this was done in the lifetime of the Prince Navigator. At his death the work was continued, with almost equal zeal, by the kings—his nephews—Alfonso the African, Joaõ the Perfect Prince, Manoel the Fortunate. Portugal was indeed fortunate in her sovereigns of the house of Avis, fit guides and leaders of the little hero nation, as Schlegel calls her. The ships of Alfonso reached Sierra Leone in 1462, made a colony at Lamina, on the coast of Guinea, crossed the equator, and sailed as far south as Cape St. Catherine. His son, "O Principe perfeito," sent Diogo de Azambuja to found the castle at Lamina, and Diogo Cam to push southward, until at length the Congo was reached.

The *padraos* were intended to be eternal monuments of Portuguese achievement. They were stone pillars with an inscription, and the arms of Portugal carved upon them—the well-known "cinco chagas," with the orle of the seven castles of Algarve. Each explorer was to plant one on a conspicuous point at his furthest point. The *padraos*

were named after saints. That of Santo Agostinho (once planted in 13° 27′ 15″ S. (south of Benguela)) is now in the museum of the Geographical Society at Lisbon, as well as that once on Cabo Negro, in 15° 40′ 30″ S. Two of these *padraos* were on the arms granted to Diogo Cam, the discoverer of the Congo.

It was the ambition of each successive Portuguese voyager to plant a national monument beyond the furthest point reached by his predecessor. None had been so zealous in this glorious work as the family of Diaz, whose first sailor scions were trained in the school of Prince Henry. Joaõ Diaz rounded Cape Bojador, Dinis Diaz first reached Cape Verde, and Bartholomeu Diaz was destined to complete the maritime fame of his family by being the first to round the southernmost point of Africa, planting *padraos* as he proceeded. In 1487, Bartholomeu Diaz passed the Table mountain undiscerned amidst the stormy waves, rounded Cape Agulhas, the southernmost point of Africa, and reached the Great Fish river, which he named after his companion, Joaõ Infanta. It was with great reluctance that the gallant Diaz, complying with the urgent entreaties of his crew, shaped a course homewards; and then it was that he first sighted the cape, which received from him the name of Cabo Tormentoso, and which the king changed to the Cape of Good Hope. Covilham, exploring southwards from Egypt, had discovered the whole east coast of Africa as far as Sofala, and had sent a full report from Cairo to King Joaõ. So that there was nothing left to discover, except the bit of African coast from the Great Fish river to Sofala.

The goal was well in sight. The eastern side of Africa had been reached by Diaz, and was known through the report of Covilham. Thence the next explorer would stretch across to the shores of India. King Joaõ prepared for the final and crowning expedition by the building of two suitable ships, which were commenced under the superintendence of Bartholomeu Diaz, the ablest and most successful Portuguese explorer of that age. But in 1495 the king died, and the great work remained to be achieved in the reign of his successor, King Manoel ("O Fortunado"), who was at the head of Portuguese affairs for the next fifty-six years. He continued the equipment of the expedition, which had been commenced by his predecessor.

Then it was that Da Gama appeared on the scene. Camoens introduces him—

> "Vasco da Gama, valiant capitayne,
> For derring do the noblest volunteer;
> Of notable courage and of noble strain,
> Whom smiles of constant fortune love to cheer."

The Da Gamas came of an ancient, valiant, and loyal house, their ancestors having fought by the side of Alfonso III. in the conquest of Algarve from the Moors, and by the side of Alfonso V., "the Brave," at the battle of Salado. Estevan da Gama, their father, was chief

magistrate of Sines; and here Vasco and his brothers were born. The little town of Sines is situated in a bay, about halfway between Lisbon and Cape St. Vincent. To the west are the blue waves of the Atlantic, but to landward an undulating sandy plain extends for several leagues. On the north side of the bay there is a granite ridge running out into the sea, and on the top of the cliff there is a small church built by Vasco da Gama towards the end of his life.

The four sons of Estevan da Gama appear to have been born and brought up at Sines; but I believe that little or nothing is known of them before the date of the great expedition. The two ships had been built, the *Sam Gabriel* of 120 and the *Sam Rafael* of 100 tons; another vessel was purchased from a Lagos pilot named Berrio, and named after him; and a provision-ship of 200 tons was also got ready. Then it was that Vasco da Gama was selected by King Manoel to command the expedition. He was not more than twenty-eight years of age. His eldest brother, Paulo, was equally fitted for the post, but he insisted upon accompanying and serving under Vasco, in command of the second ship. They both looked upon Nicholas Coelho, who was captain of the *Berrio*, as their brother.

Paulo da Gama was one of the kindest and most lovable of men, and his presence in the fleet was an influence for good. The best trait in the character of Vasco was his love for and devotion to his elder brother.

All things were prepared for the great enterprise, and the ships were ready in the Tagus. The beautiful church of Belem was not then built on the beach of Restrello, but Vasco da Gama passed the night before his departure in prayer in a little chapel which had been erected there by Prince Henry. He embarked next morning, and the expedition sailed on Saturday, July 8, 1497; there were about 160 souls all told. Six *padraos* were taken out, to be set up on prominent headlands, but not one of them is now known to exist. The fleet was accompanied by the great navigator, Bartholomeu Diaz, as far as the Cape Verde islands. He was going out in a fast caravel, to take up his command of the new Portuguese settlement of Lamina, on the coast of Guinea.

In December the expedition reached the "Rio do Infante," the furthest point of Bartholomeu Diaz on the eastern side of Africa, and entered upon new ground. Correa reports that there was a mutiny at this critical time. The men feared to proceed further, and wanted to return, according to this author, who adds that Vasco da Gama put the master and pilot in irons for giving the same advice, and threw all their instruments overboard. His brother Paulo induced his crew to obey orders by argument and persuasion, and interceded for Vasco's prisoners. This mutiny is not mentioned in the "Roteiro."

The first experience of the explorers on entering the previously unknown ocean was the force of the current, so strong that they feared it might frustrate their plans, until a fresh stern wind sprang up, which

enabled them to overcome it. This Agulhas current was first scientifically investigated by Major Rennell in 1777.

Vasco da Gama passed the coast, which was named by him "Natal," on Christmas Day, and was well received by the natives of Delagoa bay. He was at Quillimane in January, 1498; at Mozambique in March; and he reached Melinde on April 15. There was a terrible outbreak of scurvy off Mozambique, and again on the way home; and then it was that Paulo da Gama proved the guardian spirit of the expedition, giving up all his own private stores for the use of the sick, ministering to them, and warding off despondency by his words of encouragement and by his example.

The King of Melinde supplied the Portuguese with an Indian pilot, a native of Gujarat, and on April 24 the voyage was commenced across the Indian Ocean, from the east coast of Africa to Malabar. Before starting, Vasco da Gama, with the hearty concurrence of the King of Melinde, set up one of the *padraos*, with the escutcheon of the *Quinas* carved on one side, and a shield bearing a sphere on the other. Beneath was King Manoel's name. It was placed on a hill above the town.

A voyage of twenty-three days brought the adventurous discoverers in sight of the mountains above Malabar—an event which Camoens thus relates:

"Pale shone the wave beneath the golden beam,
Blue o'er the silver flood Malabria's mountains gleam;
The sailors on the maintop's airy round
'Land! Land!' aloud with waving hands resound.
Aloud the pilot of Melinda cries,
'Behold, O Chief, the shores of India rise!'
Elate the joyful crew on tiptoe trod,
And every breast with swelling raptures glowed.
Prone on his manly knees the hero fell;
'Oh, bounteous Heaven!' he cries, and spreads his hands
To bounteous Heaven, while boundless joy commands
No further word to flow."

Then the immortal poet, in words of fire, declares how this mighty deed was done, and by what kind of men:

"*Not* those who ever lean on ancient strain,
Impinge on noble trunk a barren chain;
Not those reclining on the golden beds,
Where Moscow's zebelin downy softness spreads;
Not with the novel viands exquisite;
Not with the languid wanton promenade;
Not with the pleasures varied infinite,
Which generous souls effeminate, degrade;
Not with the never conquer'd appetite,
By fortune pamper'd as by fortune made.
But by the doughty arm and sword that chase
Honour which man may proudly hail his own;
In weary vigil, in the steely case,
'Mid wrothsome winds and bitter billows thrown,

Suffering the frigid rigours in th' embrace
Of South, and regions lorn and lere, and lone,
Swallowing the tainted ration's scanty dole,
Salted with toil of body, moil of soul.
Thus honour'd hardness shall the heart prevail,
To scoff at honours, and vile gold disdain.
Whoso shall rule his life by reason's light,
Which feeble passion ne'er hath power to hide,
Shall rise (as rise he ought) to *honour true*,
Maugre his will that ne'er hath stooped to sue."

And thus was the Portuguese empire in India founded by two of Portugal's noblest sons, Vasco and Paulo da Gama. Time will not allow us to linger with them on the coast of Malabar. On March 20, 1499, they cleared the Cape, and returned to Lisbon on September 18. But Paulo da Gama had died at Terceira, in the Azores. Equal to Vasco in heroism and constancy, Paulo excelled him in the more Christian virtues, and was, as I have already said, the guardian spirit of the voyage. When Vasco is remembered, Paulo da Gama should never be forgotten. They are equal in merit, and both equally deserve to have their memories honoured by their country, and by the civilized world.

True to the spirit of perseverance and energy which had led the Portuguese to this crowning success, a large fleet was despatched to India in the year after the return of Vasco da Gama, and in each succeeding year. Vasco da Gama commanded the fourth voyage in 1502, and on his return he was created Count of Vidigueira. Then followed the brilliant achievements of Afonso d'Albuquerque, who occupied Goa, Ormuz, and Malacca, and established Portuguese power in India on a solid foundation. It was to last unchallenged for eighty years, when the disaster of El Kasr-el Kebir brought on what the Portuguese called the sixty-years' captivity.

For twenty years Vasco da Gama was unemployed, living at a house in Evora, the walls of which were painted with figures of Indian animals and plants, and hence the street in which it stood is still called "Rua das Casas Pintadas." Here he brought up a family of six sons; but in 1524 he was called from his retirement to rule over Portuguese India. He went out with a large fleet, surrounded by all the pomp and circumstance of a viceroy, and he died at Cochin, on the scene of his discoveries, on Christmas Day, 1524, aged 55.

Vasco da Gama is described as a man of middle stature, rather stout, and of a florid complexion. The portrait, which belonged to Count Lavradio, is given by Lord Stanley of Alderley, in his translation of the account of Da Gama's voyages in the 'Lendes da India,' of Correa. It is a copy of the portrait in the Museu das Bellas Artes at Lisbon, a photograph from which is given in Ravenstein's 'Roteiro.' It represents a handsome man, aged about fifty, with a white beard and severe

expression, wearing a furred robe, and the cross of the order of Christ hanging from a chain round his neck. *His crest* was a girthed doe trippant, or. *Arms*—chequy of fifteen, or and gules; two bars argent; over all an escutcheon with the *quinas* of Portugal.

Luis Camoens, the great epic poet, is said to have been born in the year that Da Gama died; and Lord Stanley says, I think truly, that the name Vasco da Gama has left in history is due largely to the great genius of Camoens. "The discovery of India," says Schlegel, "the greatest event of modern times, could only be worthily celebrated by one who had himself passed a portion of his life in those regions. A warrior could only thus have written.

"At the proudest moment of that brief but glorious period of Portugal's greatness, one great national song broke forth, like the dying note of the fabled swan, a dirge for the departing hero-nation. The remembrance of her departed glory is enshrined in this immortal work, created by the divine genius of her national poet to immortalize her fame. The exquisite bloom and grace of the diction of Camoens are unparalleled among modern writers." *

The most learned and accomplished English traveller of modern times, the late Sir Richard Burton, devoted twenty years of his life to the study and translation of the 'Lusiads of Camoens.' He declared that he felt a glow of pleasure at having undertaken it—at having lived so long in contact with so noble a spirit as that of his master. He also took pride in the ambition of familiarizing his fellow-countrymen with a workman and a work not readily to be rivalled in the region of literature. No single publication extant gives so full and general a portrait of Camoens, his life and his work, as that of Sir Richard Burton, and his translation is undoubtedly the most faithful and the best in our language. The Hakluyt Society, of which I have the honour to be President, has also laboured to make the achievement of Vasco da Gama better known in this country. In 1869 we brought out the 'Lendas' by Gaspar Correa, translated and edited by Lord Stanley of Alderley; and this year, with a view to celebrating the present commemoration, we have published the 'Roteiro' of the first voyage, which has been ably translated and edited by Mr. Ravenstein.†

After the sixty years of captivity came to an end, Portugal rose like a phœnix from its ashes. The old alliance with England was renewed. It was commenced when the founder of the house of Avis, the great King Joaõ of Good Memory married that English princess, who bore him five noble sons, including Prince Henry the Navigator. Since 1640, the year of liberation, English and Portuguese have fought side by side on many a battle-field for freedom, we have formed alliances, and now

* Schlegel.

† Bound copies of the 'Roteiro' were presented to the Prince of Wales and the Duke of York on this occasion, by the President.

our royal houses are nearly related. There are many reasons why England should feel warm sympathy for Portugal in the commemoration of the mighty deeds of her sons. The nation of heroic memories has a glorious history to be proud of; and by the commemoration of the discovery of India by Vasco da Gama, we hope that those memories will impress themselves even more strongly than ever on the minds of her sons, leading them on to an honourable and prosperous future. We wish health and happiness to his faithful Majesty, and success and prosperity to our old and tried ally, the noble Portuguese nation.

After the address, the PRESIDENT requested M. A. de Castro, the Portuguese *chargé d'affaires*, to address the meeting.

M. de CASTRO: In the name of the King and of His Majesty's Government, whom I have the honour to represent on this occasion, I beg of you to accept His Majesty's and the Government's most sincere congratulations and their heartiest thanks for the spontaneous and the brilliant homage to the memory of that Portuguese who not only was a great man for his own country, but who rendered so important and so valued a service to the whole civilized world, by opening a way across seas never before navigated for commerce, civilization, and Christianity. The life and the glorious deeds of Vasco da Gama and his daring companions were so thoroughly brought before you by the President of this learned Society, that I feel it to be beyond my power to add to what has been already said. The kind words used by Sir Clements Markham towards Portugal—which I shall not fail to transmit to my Government—will, I am sure, be highly appreciated by them, as well as by the whole Portuguese nation, and I avail myself of this opportunity to pay a tribute to the Royal Geographical Society of London, which upon all occasions and opportunities has shown its great sympathy with, and its high esteem for, my country. The high honour which their Royal Highnesses, the Prince of Wales and the Duke of York, have conferred by their presence at this meeting, and for which I find no words to express the gratitude of my country, shows not only the great interest and the appreciation of their Royal Highnesses for all memorable events, but is also a most precious token of friendship between the old allies, Portugal and England. I wish to also tender the thanks of the Portuguese Government to the Right Hon. Lord George Hamilton for the brilliant part her Majesty's Government takes in the celebration, by sending to the Tagus, to join in the festivities which are now taking place at Lisbon, six magnificent ships from the Channel Squadron of England, for which, and for the prosperity and happiness of its great Queen and Royal Family, I express the most sincere desire.

The PRESIDENT: I now request Lord George Hamilton (Secretary of State for India) to address the meeting.

Lord GEORGE HAMILTON: In obedience to the request of the Chairman,

I will add a very few words to the eloquent tribute which he has paid to the great navigator, concerning whom we have met here to-day. If there is anybody in her Majesty's dominions who will be likely to acknowledge the greatness of the feat by which for the first time he established water communication between India and the Western maritime countries of Europe—if there is anybody who would be disposed to recognize that feat, it is the representative of the Government of India, for it was in consequence of that discovery that we were hereafter able to found that dominion which I think is the boast of every Englishman. For if to Portugal is given the indisputable glory of having produced this great seaman, we, as Englishmen, have the satisfaction of knowing that we as a nation have probably derived more material benefit from those discoveries than any other country in the world. I do not think your President has in any degree exaggerated the importance of the discovery made in the voyage to which he has alluded. During the past few centuries there have been many inventions and many discoveries which have had a great influence upon the course of civilization, and which have shaped the policy and the course of various nations; but I doubt if there is any event which has ever had a more permanent and lasting effect upon the commerce and the trade and the policy of the Western maritime countries of Europe than the discovery that there was a free and uninterrupted watercourse between India and the West of Europe. For let us just depict to ourselves what was then the condition of the trade and the commerce of the civilized world. By far the most lucrative and important commerce was that which passed through India and through Central Asia to the eastern parts of the Mediterranean. So long as that commerce could only pass to Europe by land routes, those who lived in the vicinity of the Arabian or the Persian gulf had more or less the monopoly of those trade goods, and it was the object, so far as one knows from history, of almost every great sovereign and every great nation established in the eastern part of the Mediterranean to try to get as large a proportion as they possibly could of this lucrative trade; and not only did it give great wealth and power to those who inhabited the Asiatic side of the Mediterranean, but it also created a sea-carrying fleet for this commerce, and merchandise had to be carried from the Mediterranean to other parts of Europe. Those parts of Europe which were in the closest proximity to Asia naturally benefited the most from this commerce; and thus it came to pass that Greece, Italy, and the north of Africa practically monopolized the benefits of this lucrative trade. Spain, Portugal, France, Great Britain, and Holland were, by their inaccessibility to the ports at which this commerce debouched, practically precluded from getting any benefit from this trade. Vasco da Gama by one discovery destroyed the monopoly which the land-routes of this trade used to enjoy, and he contrived to disperse its

benefits amongst the Western nations of Europe; but from the time his discovery was made there were numbers of adventurous rovers and seamen from all the countries I have indicated—from Portugal, from Spain, from France, from Great Britain, and from Holland—who, anxious to follow in his steps, coasted round the Cape of Good Hope. Then began the commencement of the founding of that series of colonies and of trade posts all along the eastern coasts of Africa and the southern coasts of Asia—a process that has gone on up to this day, until at the present moment the Western nations of Europe have as great a monopoly of Eastern trade as four hundred years ago the eastern portions of the Mediterranean enjoyed. Now, that is a great revolution, but the Portuguese Secretary, in his admirably expressed speech, pointed out that Vasco da Gama did much not only for commerce, but for Christianity. In an indirect way I believe this discovery had a great effect upon the conflict that was then going on between Mohammedanism and Christianity in the eastern part of Europe and in certain parts of Asia and in Africa. The Mohammedan advance seemed irresistible, and one of the reasons, I believe, was that they had the monopoly of all these trade routes, and having that monopoly they were able to largely increase their sinews of war. But by the knowledge that there was a sea-route round the south of Africa, a gradual diversion of that trade took place; the sea-carrying power of the Eastern states in the Mediterranean to a considerable extent decreased; and when, some seventy years after, at the great battle of Lepanto, the Mohammedan naval supremacy in the Mediterranean was destroyed, I believe Vasco da Gama, seventy years previously, did as much to contribute to that defeat as the victorious fleet itself. And if I turn to the Government on whose behalf I am speaking—the Government of India—I think I may say that the revolution which this discovery made was greater in India than in any other part of the world. For from time immemorial India had been the prey of a conqueror, but the conqueror had always come from the north; it was from the plateaus of the high ranges of India that century after century hordes of savage mountaineers devastated the country, and destroyed those with whom they came into contact. But under the happy auspices of the discovery which we are celebrating to-night, a kindlier era of invasion was inaugurated in India. The white man came from the south, and with him brought the blessings of stable government, and various European nations have been able to establish throughout India a system of rule and of dominion by which the civilized races there have greatly benefited, and have increased both in numbers and prosperity. If, Mr. President, we may congratulate ourselves that in India we have got the lion's share of that dominion, let it never by Englishmen be forgotten that it was to a Portuguese that we owe the discovery of a course of communication between India and Great Britain, and that it was through a Portuguese

princess, the wife of Charles II., who brought us her dowry possessions on the western coast of India, that we got our first hold by which we have built up that system of dominion and administration of which we are so proud. And therefore, looking back to the past, it does seem to me that we have much for which we should be grateful to Portugal, and I heartily echo the concluding and eloquent words of your President's speech—that a sense of those benefits which we have derived from Portugal may establish between this country and that even kindlier relations than before, and that the future may be associated with the closest ties of amity between us and our old and much-trusted ally.

H.R.H. the PRINCE OF WALES: Before we separate to-night, I am anxious to read to you two telegrams. I sent one this afternoon to the King of Portugal: "As we are to-day celebrating, at the Royal Geographical Society, the four hundredth anniversary of Vasco da Gama's great discovery, we send your Majesty our hearty congratulations on this important event." On entering these rooms to-night, I received the following answer from the King: "Portugal celebrates to-day the glorious date of the arrival of the great Vasco da Gama in India. We all thank your Royal Highness and the British nation for the honour you are doing us to-night at the Royal Geographical Society." I must express the pleasure it has given me and my son to be present on this interesting occasion, and I beg of the *chargé d'affaires* of Portugal, who has delivered such an excellent address to-night, to express to the King and the Government of his country, and to the Portuguese nation, how entirely we sympathize with him in everything that concerns the celebrations which are taking place this week. I believe, ladies and gentlemen, that Portugal has every reason to be proud of her expeditions of discovery which culminated in the voyage of Vasco da Gama round the Cape of Good Hope to India. I need not remind you that the great series of voyages which revealed to the world for the first time the real outline and extent of the continent of Africa, was initiated during the fifteenth century by Prince Henry the Navigator, whose mother was English, being the daughter of John of Gaunt. We in England have every reason to be grateful to Prince Henry and the Portuguese, for we have profited more than any other nation by those great discoveries. It is, therefore, most appropriate that we should meet to-night and join with Portugal in celebrating the fourth centenary of the voyage which has had such a marked effect on the history of the world in general, and of our own country in particular.

The PRESIDENT: I feel sure you will wish me to convey to His Royal Highness the Prince of Wales and His Royal Highness the Duke of York our sense of their kindness in coming here this evening. I am sure you will all agree with me that their presence has added very much to the interest, and, indeed, to the significance, of our commemoration of the achievement of Vasco da Gama.

THE 'ROTEIRO' OF DA GAMA'S VOYAGE.

In connection with the Vasco da Gama celebrations, Mr. Ravenstein has done a service to English readers by translating and editing for the Hakluyt Society the 'Roteiro,' or *Journal* of the first voyage to India, which is the only available account written by a member of the expedition. An English version of the three voyages of Da Gama, as described by Gaspar Correa in his 'Lendas da India,' had already been published some years ago by the Hakluyt Society, under the editorship of Lord Stanley of Alderley. But, as Mr. Ravenstein points out, Correa's account differs materially from all others which have come down to us, and if we accept it, we must reject the almost unanimous evidence of other writers of authority; while it is probable that Correa's long residence in India, some years after the date of the first voyage, prevented him from obtaining accurate information, such as would have been found in the Archives of Lisbon. The 'Roteiro,' now published for the first time in English, forms, in fact, the only contemporary account, with the exception of second-hand versions contained in letters written by King Manuel and Girolamo Sernigi (also reproduced by Mr. Ravenstein), and its value is therefore at once apparent. The manuscript, the substance of which was first given to the public in 1838 by the Portuguese edition of Prof. Kopke and Dr. A. da Costa Paiva, originally belonged to the Convent of Santa Cruz at Coimbra, whence it was transferred to the public library of Oporto. Internal evidence shows it to be, not the original journal, but a copy, the names of author and copyist being alike unknown. It was suggested by Prof. Kopke that the latter was the famous historian Castanheda, who appears to have depended, for his account of the first voyage, almost exclusively on the 'Roteiro;' but for this there is no valid evidence. Mr. Ravenstein also differs from Prof. Kopke as regards the opinion of the latter that the author must have been a common sailor or soldier, showing that he must at least have been a man of judgment, and equal in literary ability to many men holding high position in those days. A process of elimination removes all but eight of the names of those known to have accompanied Da Gama from the claim to the authorship, but there is no proof that the author's name occurs in any account we possess. The text of the 'Roteiro' is fully elucidated by footnotes, and Mr. Ravenstein has evidently spared no pains in the endeavour to make the edition useful to his readers. His wide knowledge of the history of geographical exploration, and especially of all that has been written abroad on the subject of the voyage in question, renders the book one of the most valuable of those issued by the Hakluyt Society. It is abundantly illustrated by portraits, maps, and facsimiles bearing on its subject, and information of much value on various points is given in appendices.

That dealing with the early maps, on which the results of the Portuguese voyages were shown, deserves special mention, a useful feature being the reproduction of portions of Cantino's and Canerio's charts of 1502, as well as of an anonymous map, probably of the same date, in the possession of Dr. Hamy. Although portions of Canerio's map have been reproduced in more than one collection, we believe that the Asiatic section has never previously been published.

THE GEOGRAPHY AND RESOURCES OF THE YUKON BASIN.*

By WILLIAM OGILVIE, of the Topographical Survey of Canada.

AFTER the kind things that have been expressed towards myself by the President, and endorsed by you, I feel somewhat put out. I feel that I cannot conscientiously apply them all to myself; I will therefore accept them as being offered me as the representative of the country whence I come, a country that I am proud to tell you is more British, perhaps, than any other part of this vast empire. A few years ago, perhaps a generation ago, that feeling was not exhibited to the same extent that it is now. Then it might have been compared to a small stream gently meandering through the land, and affecting all that it came in contact with; now it is a resistless torrent sweeping everything out of its way, and permeating the whole of the country with a thoroughly British feeling, and making us take a pride in being part of the British Empire, and glorying in the history and traditions of the British Empire, a much as you who are listening to me.

There is a common saying that blood is thicker than water. So it is; but there is a substance that, unfortunately, many people consider much thicker than blood and much heavier than water, that is, gold. I have come to speak a short time this evening on that subject in connection with the Yukon district, and to do so, I shall have to deal first of all at some length with the geography of the Yukon basin. I hope I shall not weary you, but it will take me some time to get through, because it is a very long river, so long that you might wrap it round this little island, and then tie a knot with the ends. After that I will make a few remarks about the gold deposits, their extent and probable development; after that, a few remarks on the habits and customs of the people; and then on the weather, and I would recommend you all to put on your wraps before I read the temperatures that have been observed there. Then I have some fifty odd slides to show you, exhibiting the surface features of the country from the head of the Yukon to its mouth, and these pictures will show you better than any word-pictures of mine, the surface of the country.

The map shows you Alaska proper. The dotted line is the 141st

* Read at the Royal Geographical Society, March 23, 1898. Map, p. 112.

meridian west of Greenwich. It is the international boundary-line between Canada and Alaska. My first visit to the country was made in order to determine where that meridian crossed the Yukon river, and in connection with this I made a survey from the head of the Chilkat inlet, across the mountains to the lakes at the head of the Lewes river, and down that river to the boundary.

Now we will begin at the Dyea pass, taking the Lewes branch first, afterwards the Teslin river, and then the Pelly. Beginning at tide water on Dyea pass, we make our way about 8 miles up the valley of Dyea river over the moraine of an ancient glacier; then we have about

LOOKING NORTHWARD AND LANDWARD FROM PENINSULA BETWEEN CHILKAT AND CHILKOOT INLETS.
(Photo by J. J. McArthur, D.L. Surveyor.)

3½ miles to make our way through woods, where there is now a road cut, to Sheep camp, about 1000 feet above sea; from there to the summit, about 3 miles, we ascend 2600 feet. No part of it is very steep until you get near the summit, when there is about 500 feet which has a slope of from 35° to 40°. The first time I walked over, I carried my chronometer in one hand, a magnetic dip-circle in the other, a barometer on my back, and some other instruments of less importance. You have, no doubt, seen this pass pictured as being almost perpendicular at some points. I have not seen those places yet, and I have gone over several times. Down to Lake Lindeman we descend 1350 feet, and

travel 8½ miles from the summit. Lake Lindeman is about 4½ miles long. We descend it, and then cross a sandy ridge, a little less than a mile, to Lake Bennett, which brings us to the head of the navigable waters of the Lewes branch of the Yukon river. Lake Bennett is 25½ miles in length; midway there is a branch which strikes off to the south-west, which is about 14 or 15 miles long; heading in some of the glaciers of the coast range. At the foot of Lake Bennett we reach what is called Cariboo crossing; it is about 2½ miles long, and out of it we go into Tagish lake, 17 miles in length. At the foot of this there are 5 miles of a small river, averaging 100 yards in width, and from 6 to 12 feet

LOOKING NORTH-WESTWARD ACROSS DYEA AND CHILKOOT INLETS.
(*Photo by J. J. McArthur, D.L. Surveyor.*)

deep. Passing it, we arrive at Marsh lake, 19 miles long, with good water all the way through. At the foot we strike the river proper, and go down it 25½ miles to the cañon. The cañon is about 70 to 90 feet wide. The walls are of basaltic rock, and about as high as it is wide. The stream is so swift that you run through it, ⅝ of a mile, in about three minutes. At the foot is a rather rough rapid, and after running through a pond-like expanse in the river below this rapid, you make a sharp turn to the left, and then to the right, and that brings you to the White Horse rapid, which is the only dangerous spot in the river. A great many have run through it safely, but many have lost their lives there; I traced thirteen deaths by drowning in 1895 at this point. Fourteen and a half miles below the White Horse a river joins, called

Takhina, or in English, Mosquito river. This joins from the west, and flows out of a large lake about 30 miles above its mouth. Thirteen and a half miles below that we reach Lake Labarge, the largest lake on the river, 31½ miles long. Out of that we make our way down what is known to the miners as the Thirty-mile river to the mouth of the Teslin. Most of that reach of 31 miles is a very rapid current, and there are several big rocks in various places; but they are not formidable, because they are easily seen, and you can avoid them.

Now we will go back to the coast, and go over the much-discussed Teslin route. The Stickine river has been navigated by boats for over twenty years. There is a small steamboat which plies up that river to Telegraph creek, about 150 miles, every year making several runs. In 1896 and 1897 the Hudson Bay Company's steamer *Caledonia* made four trips from Port Simpson up through the coast tidal rivers to the mouth of the river—two in '96 and two in '97. These voyages were made in the best season of the year, no doubt, when there was plenty of water in the river; but I do not think there is any doubt whatever but that that river can be navigated by light-draught stern-wheel steamers during open water—that is, from the middle of May to the middle of November. It is said, and it has been discussed very much at length, that trouble will be raised at Wrangell over the transfer of cargo from the ships to the boats. If it is, we can unload at Simpson, in British territory, the only objection to this being that you have to cross Dixon's entrance in a river steamer, and a strong wind makes it too rough, and such boats would have to abide the event of the weather for departure from and return to that port. With this probable detention, we can ply from a British port to a British port, and the only part of foreign territory that we have to traverse is the coast strip which the Americans claim—is 34 miles in width, which width we do not admit. It is 170 miles from Simpson to Wrangell in ocean water, and from Wrangell to Telegraph creek 150 miles on the Stikine river. From Telegraph creek overland to Teslin lake is about 150 miles of tolerably easy country—that is, when you compare it with the rest of that country, which is very mountainous. It would not be called easy here; nevertheless, by next autumn the probabilities are we shall have a railroad from Telegraph creek to Teslin lake. Now, the lake was surveyed last fall by one of our surveyors, Mr. St. Cyr, and my son. It is 65 miles in length, and from ½ to 2 miles in width, and from the foot of the lake down the Teslin river (known to the miners as the Hootalinqua) is 135 miles to the junction with the Lewes. From there we continue 36½ miles to Big Salmon river, which is an unimportant stream, only of note in the sense that gold has been found all along it, not in large quantities, but still it is there. It has been explored up to Quiet lake, an estimated distance of 200 miles, and the lake is reported 24 miles long, but it is probable this is much in excess of the true

distances. From Big Salmon river to Little Salmon river is about 36 miles, and from there to Nordenskiöld river is about 29 miles.

We will now go back again and take the Dalton trail, beginning at the mouth of the Chilkat river, and going up it to its confluence with the Klehini river, joining from the west, up which we go some distance; and then take overland over a succession of low passes, said to be about 3000 feet above sea-level. Ninety-five miles from the coast you strike the summit proper—that is, the summit of the watershed between the Alsek river and the streams flowing into

LOOKING DOWN CAÑON FROM HEAD.

Chilkat inlet—and from there you have an easy undulating country to traverse until you strike the Lewes river near the mouth of the Nordenskiöld river, some 130 miles below Teslin river. A short distance below the Nordenskiöld is the principal obstruction in the river—that is, when we descend by the Teslin branch—known to the miners as the Five Finger Rapids, and to the coast Indians as the Yeth Katzi, or the Raven islands, because there are five masses of rock or islands standing in the channel, on which those birds nest. The river has worn its way through a barrier of conglomerate rock, part of which now remains on both sides, and left these five masses standing in the stream. The ravens make their nests there because they are protected from the depredations of animals. The local or Tagish Indians call them Chi Cho, or big

rocks. From the Five Fingers down to the mouth of the Pelly is about 57 miles, or 375 miles from the head of Bennett lake, by way of the Dyea or White pass, and through the cañon, White Horse, and Five Fingers. To the Pelly by way of the Teslin route is 387 miles from the head of Teslin lake, with only one hindrance to easy navigation—the Five Fingers. With these interruptions both those routes are easily navigable; the first from the head of Bennett lake, the last from the head of Teslin lake.

The Five Finger rapids are not more than a detention, for any ordinary river steamer can ascend them with the aid of a line, or warping, as it is termed. A line is fastened to some point on the shore ahead,

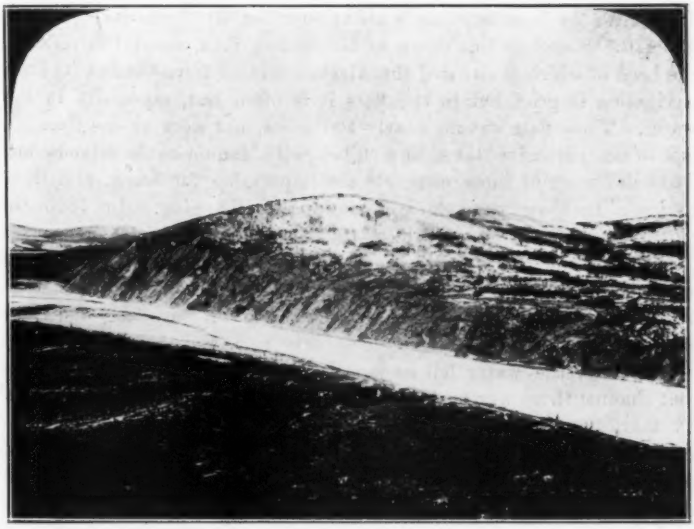
LOOKING DOWN "WHITE HORSE" RAPIDS.

and the boat helps to pull herself up by hauling on this line with her steam capstan or winch. The detention is caused by the water being dammed by the rocks mentioned. This raises it somewhat, and there is a short plunge of from 1 to 2 feet down to the level below. This plunge does not extend over more than a score of yards. Both above the rapids and below there are several miles of strong current, but not enough to prevent steamers ascending it; and once past this, there is no trouble up to the head of Lake Teslin by the Teslin route, or up to the White Horse rapids on the Lewes, 220 miles above Five Fingers and 97 below the head of Bennett lake.

Now, the Pelly was examined and surveyed by Dr. Dawson in 1887,

the same year that I made the instrumental survey of the Lewes. He made his way up the Stickine, across to Dease lake, and down the lake and the river of the same name to the Liard river, up which he went to Frances river, ascended it and the lake of the same name, and crossed the watershed of the Liard and Pelly to a point on the latter in 61° 49′ N. lat. and 131° 31′ W. long. From this point he made a survey down the Pelly to its mouth, 320 miles.

From the mouth up he reports it navigable for river steamers to Granite cañon, 61 miles up. This cañon is about 4 miles in length, and a steamer might have difficulty in ascending it owing to crooks, but



BIRD'S-EYE VIEW OF SITE OF "DAWSON" AT MOUTH OF KLONDIKE, APRIL, 1897.

he thinks by warping she would succeed. Nine miles above the cañon the Macmillan river joins from the north-east. Above the cañon the doctor is of opinion that a smaller or lighter draught boat could ply up the Pelly to Ross river, about 250 miles above the junction with the Lewes; and probably the same steamer could ascend the Macmillan 40 or 50 miles.

From Fort Selkirk, or what was Fort Selkirk, the old Hudson Bay trading post a mile below the mouth of the Pelly, down to White river is 96 miles. White river joins the Yukon from the west, and a great part of it is in our own territory, but much of the head is in Alaska. This river branches some 25 or 30 miles above the mouth, and the north branch heads close to Sixty-mile and Forty-mile rivers. The other branch

is reported to head in a very large lake north-east of Mount St. Elias, named Kluahne lake. Another branch is reported to head south-west of this in another large lake. Copper is reported on the upper stretches of this river, but has not been located yet. Ten miles below White river, Stewart river joins from the east. It is reported to be navigable for light-draft steamers up to the falls, about 150 miles, as near as I can ascertain from the reports of miners. One or two of the branches of this stream may afford another 100 miles of navigable water for the same class of steamers. One of them heads in a lake called Mayo lake, reported about 25 miles in length, but narrow. From the Stewart to Dawson is 69 miles, all good navigable water. From Dawson to the boundary-line is about 90 miles, all of which is good too. From the boundary-line down to the Yukon flats, about 130 miles, at the head of which is situated the Alaskan mining town Circle City; the navigation is good, but in the flats it is often bad, especially in low water. These flats extend nearly 100 miles, and were at one time the bed of an extensive lake, now filled with innumerable islands and channels; most of those channels are impassable for boats, and those channels that are passable are continually changing. In 1895 the record season was accomplished, that is, one of the steamers made five trips from the mouth of the river to Forty-mile, which was then the highest point on the river at which trade was done, estimated to be about 1500 miles above the mouth. In 1896 the same boat made four trips; in 1897 some only two, and some three. The trouble was, the water fell so rapidly in August, that in the steamboat channel there were only 22 inches of water. The result was they lay there from the middle of August until October, and some are still in that vicinity. Two of them got up with very light loads to Dawson, and the non-arrival of the others was the cause of the threatened starvation there, which I am happy to say was nearly altogether baseless; there never was any serious fear of extensive starvation. After getting through the flats, we make our way down the river without any trouble until we get some 900 or 1000 miles farther down, where the river begins to spread out again, and often there is difficulty, on account of the many different channels; and when you get into the delta you have much trouble again. The channel generally used is narrow, crooked, and shallow, and boats often ground in it. The boat I came down on lay on a bar in the mouth of the river a day before she could get off. Then we were three days outside a mile or two at anchor before we could cross Berings sea to St. Michael's, which is some 72 miles off.

Now let me recapitulate. From the head of Lake Bennett on the Lewes branch to the cañon, 95 miles, all easily and safely navigable. The cañon and adjacent rapids, 2½ miles long, absolutely impassable for steamers; and from the foot of those rapids to the mouth of the Teslin,

90½ miles, some of which is strong current, but not impassable, and Lake Labarge, which might prove too rough at times for boats light enough for the river. From the head of Teslin lake, by the Teslin route, to the foot is 65 miles, and this lake too might at times prove too rough for light river boats, but it is not so wide as the other lake (Labarge) on the Lewes; besides, Teslin lake is more crooked, and thus affords more shelter from rough water then Labarge. From the foot of Teslin lake to Lewes river, following the course of Teslin river, is 135 miles, all easily navigable. From the junction of those two streams to the Five Finger rapids, 129 miles, is all easily navigable, and, as has been

LOOKING UP YUKON RIVER FROM NEAR DAWSON, 1870 FEET ABOVE RIVER, APRIL, 1897.

already intimated, those rapids are not serious. From the rapids down to the Pelly is 58½ miles of good river. On the Pelly, as already stated, we have 60 miles of ordinary steamboat course, and probably 220 to 250 more for smaller steamers, with no break in its continuity.

From Pelly to White river, 96 miles, all good; the heaviest steamers now on the river have made several runs over it. Between White and Stewart rivers, 10 miles, there are no hindrances to the boats now navigating the Yukon. It is doubtful if the White can be navigated at all by steamers, as it is very shallow and swift at the mouth. Stewart, as already intimated, is navigable for about 150 miles by light-draught steamers, and some of its affluents will possibly afford 50 to 100 more. Between Stewart river and the International boundary-line, 158½ miles, no stream of importance joins. Summing this, we get

636½ miles of navigable water on the Lewes branch, exclusive of the cañon rapids, which are insuperable; 200 on the Teslin, about 300 on the Pelly and branches, and 200 on the Stewart. In all 1336½ miles, of which over 1200 we know to be navigable. From the boundary to the mouth is estimated at 1487 miles; it is all navigable with some difficulty at points as already stated. The Porcupine, about 210 miles below the boundary, will likely afford about 400 more miles of navigable water. It does not appear that the Tanana, the only other large stream joining the Yukon, is navigable any distance, but further examination may modify the reports so far received.

All this gives us over 3200 miles of fair navigation in the system of the Yukon river, of which Canada owns nearly 42 per cent. Taking the accompanying map, with those streams as they are marked on it, we have the Lewes branch and Yukon running from 59° 46′ N. lat. and 135° 13′ W. long., in a north-westerly direction for about 900 miles. It then makes a sharp turn to the left, running nearly west for about 720 miles, when it turns nearly south for about 265 miles, and then north-west again for about 230 miles, in all about 2100 miles in length. One remarkable feature in connection with this river is that it drains the interior of the peninsula of Alaska, and nearly cuts it in two, starting as it does less than 14 miles as the crow flies from the waters of the Pacific ocean at the extreme head of the Lewes branch, whence it flows 2100 miles in the manner indicated into the same ocean again, or Bering sea, which is a part of it. Now take the map attached to this paper, and with the watershed marked as we there have it—which is only approximate, because the streams are not all surveyed—and we find that the drainage basin of the river occupies about 338,000 square miles; Canada owns 149,000 of that, nearly a half, and of the river she owns less than a third, but that is much the most important part of the Yukon drainage basin. It contains the most wealth, as I hope to point out to you later on.

Now a few remarks on the gold-bearing area. The first location of gold, and the first gold bars that were worked to any extent, were on the Stewart, about 30 miles from the mouth. There was another place on the Lewes, midway between Teslin and the Big Salmon, known as Cassiar Bar, which paid well. Many other points along the Lewes also afforded good pay, and were worked for several seasons, until the discovery of coarse gold on Forty-mile river in 1886, which, becoming known, drew all the miners in the country to it. Coarse gold was discovered on Birch creek in 1891, which in 1892 originated Circle City in Alaska. In 1896 gold was discovered on Bonanza creek, a tributary of Troandik (commonly known as and called Klondike). The first name is the correct Indian one, and means Hammer creek, from the fact that they used to erect barriers across the mouth to catch salmon by hammering sticks into the ground.

By the way, I forgot, in the proper place, to mention the probable origin of the name "Yukon." The Indians along the middle stretches of the river all speak the same language, and they call the river the Yukonah, which in English is "the great river," or, in short, "the river," because it is the only river they know. Our Indians in the vicinity of Forty-mile call it "The-tuh." What that means I cannot tell you, and they laughed at my simplicity for asking when I tried to find out.

Gold was discovered on Bonanza creek, August 16, 1896; that led to the discovery and development of the celebrated Klondike region. Gold has been found on the Stewart up to the head. One man,

LOOKING ACROSS BONANZA AND UP ELDORADO CREEKS, APRIL, 1897.

Alexander Macdonald, prospected this river all the way up in 1886, and remained in that region alone during two different seasons. During the summer of 1887 he crossed to the headwaters of what is evidently a branch of the Peel, and prospected it for some distance down, and found gold in the gravel as far as he went; and in 1873, Mr. Arthur Harper, the pioneer prospector of the Yukon, found gold in the sands and gravels at the mouth of the Peel, which corroborates Macdonald's statement, for the geological formations near the mouth preclude the idea of gold there other than what has drifted down the river. From this we infer that a considerable portion of the upper Peel is also in the auriferous area. Several parties leaving Canada

this season are determined to test this, and I have no doubt but that it will be investigated ere many months.

Gold is also found on the Pelly. Miners have been prospecting there for years, but never got a great deal, though they generally got enough to keep them in supplies for a year. Big Salmon river was also found to be gold-bearing over its whole length. The Teslin river was prospected in 1886–7, and in some places very good indications found. I found gold on the Lewes when I went in 1887, up near Lake Labarge; I also found gold in the drift, well up on Bennett lake—very little, it is true, but enough to swear by. The celebrated Cassair district

JUNCTION OF YUKON AND FORTY-MILE RIVERS, WITH TOWN OF FORTY-MILE BETWEEN.

is south of the head of the Teslin, which was worked in the seventies. Along the head of the Liard river gold is known to exist. At Dalton's crossing of the upper Alsek or Tatshenshini river gold was discovered in 1896, by a man who was fording the stream on horseback; the brute stumbled and threw him into the water. Scrambling ashore through the icy water as fast as he could, he seized a small bush to help him up; it came away by the roots. The clay which came with it was washed in the rapid current, and he saw something bright, which he picked up and found to be gold. This he exhibited at Forty-mile on his arrival there some months after. Fine gold is also reported at a couple of points midway between this point and Selkirk, along the Dalton route, which is laid down on the accompanying map. Harper,

the pioneer already referred to, found light prospects along the White river, both branches of which he ascended some distance; but he was in quest of copper, which is often brought in by Indians from this vicinity, and did not pay strict attention to gold. The exact locality where they get the copper is yet unknown, but frequently they bring to the trading post quite large specimens of pure native copper, which they say they find along this river. Harper searched for and found some indications, but did not locate it.

Gold has been found on the coast at several points, notably at Juneau, in Alaska; at Ruby Sands near Lituya bay, about 50 miles west of

CONFLUENCE OF FORTY-MILE RIVER WITH YUKON, LOOKING UP BOTH STREAMS. YUKON 600 YARDS WIDE.

Cross sound, shown on the accompanying map, and south of the point where it was found on the Tatshenshini river about 100 miles. It is also found at other points further west along the coast, and we generally find it at points north of those places in the interior, from which we infer, with reason, that all the part of the Dominion north of British Columbia and west of the Yukon-Mackenzie watershed, except that part north of where the Yukon intersects the 141st meridian, is gold-bearing. Much of it, no doubt, is not rich, some of it we know is, and very much will pay well with better facilities for working.

Now as to its richness. The richest part is Trondik, better known as Klondike. On Bonanza creek, a branch of the Trondik, there are some two hundred claims, each 500 feet in length. I have no hesitation in saying that the middle hundred of these claims, that is, from about No. 60 below Discovery claim to No. 43 above Discovery, will turn out—

unless a very curious coincidence has occurred, and that is that every man has struck the only rich part in his claim, which is highly improbable—unless that is the case, I have no hesitation in saying that those claims will turn out £5,000,000. On a branch of the Bonanza—Eldorado creek—some eighty-six claims have been marked out, fifty of which I made a survey of. Forty of these were known last season to be good, and unless the indications are highly misleading, and the same coincidence has occurred again, each of those claims contains on an average 1,000,000 dollars, or £200,000. With the same indications in view, I have no hesitation in saying that those two creeks will turn out, before they are exhausted, 75,000,000 dollars, or £15,000,000. Take this little area drained by the Klondike—on one side only—and a part of Indian creek basin, about 35 miles in length, and less than 25 in breadth, unless the same coincidence has occurred again, we have 100,000,000 dollars, or £20,000,000 worth of gold in sight, and probably twice that amount before it is exhausted. On Forty-mile and on Sixty-mile, gold is found in abundance. Two of the tributaries of Sixty-mile river, Miller creek, and Glacier creek, are each about 5 miles in length, thus affording about fifty claims apiece, some of which have netted comfortable fortunes to a good many men. One claim netted in two years 70,000 dollars, or say £14,000. The owner then gave it away, and the man on whom he bestowed it is now taking a small fortune out of it. On one of the bars on Stewart river, four men took 6000 dollars (£1200) in less than a month. On the Pelly only fair wages have so far been made. Of the Teslin, we may say it is better than the Pelly, but not so good as the Stewart. In some cases, from 10 to 12 dollars, that is, from £2 to £2 10*s.*, have been made per day on its bars, and this holds good along its entire length, if report speaks truth. On the Stewart, Pelly, and Teslin, little or no prospecting has been done off the main streams, and on all the other known rich auriferous areas, it is in the smaller streams and gulches the most wealth is found.

Now, all these indications point pretty conclusively to this fact: Canada has, exclusive of the province of British Columbia, in which doubtless very much mineral wealth will be found, an area bounded on the west by the 141st meridian, on the south by the 60th parallel of latitude, and on the north and east by the summit dividing the basins of the Mackenzie and Yukon rivers, comprising upwards of 125,000 square miles, over nearly all of which we find gold in more or less abundance. This area contains approximately 7000 linear miles of river, stream, and gulch, of which we are fairly certain at least one-half is auriferous. It must be borne in mind that those miles are only *linear miles*, along which the auriferous area will not average more than 500 to 1000 feet in width. Of the half of this, or, better still, say 3000, which we can safely assume gold-bearing, only about 200 were fully tested and developed up to

August last, and at present date probably not more than 400 have been fairly well tested.

Now, while we cannot assert positively that any more Klondikes will be found, we cannot say there will not, and we can look forward with reasonable certainty to much valuable ground being found. What we know now to be rich will take several years to exhaust, and before that time, in all probability, we shall have discovered much more.

With reference to auriferous rock, a few words. There is not time now to theorize, so I will only give a few facts. The first location of gold-bearing rock in the Yukon district was made near the town

LOOKING UP CAÑON ON FORTY-MILE RIVER 8 MILES ABOVE MOUTH.

of Forty-mile, on a hill known as Cone hill. This is a veritable mountain of auriferous rock of low grade. Several tons of it have been assayed, with the result that it shows from 12*s.* or 15*s.* to 44*s.* per ton of rock, the average being about 24*s.*, or nearly 7 pennyweights. Two or three claims have been located here 1500 feet long by 600 wide, the maximum legal limit for quartz claims. Soon after, two more lodes were located opposite to where Dawson now is, but they are not extensive, though said to be richer. Up the Trondik a short distance another very extensive exposure has been discovered of low grade ore, and further up still another has been discovered which assays from 100 dollars (or £20) to 1000 dollars (or £200) to the ton.

The only difficulty about this is, we do not know the extent of it; there is no development work done, and the exposure is very small, so we cannot say whether it is as good as the others, which are more extensive, though lower grade; in fact, we cannot say it is worth developing.

Still farther up the same river another claim has been located, of which it is alleged it is very extensive, and fairly good. I can give no figures. About 20 miles below Dawson two more claims have been staked on what is stated to be one of the largest lodes in the world, and assaying an average of 28*s.* to 32*s.* per ton, or 8 to 9 pennyweights.

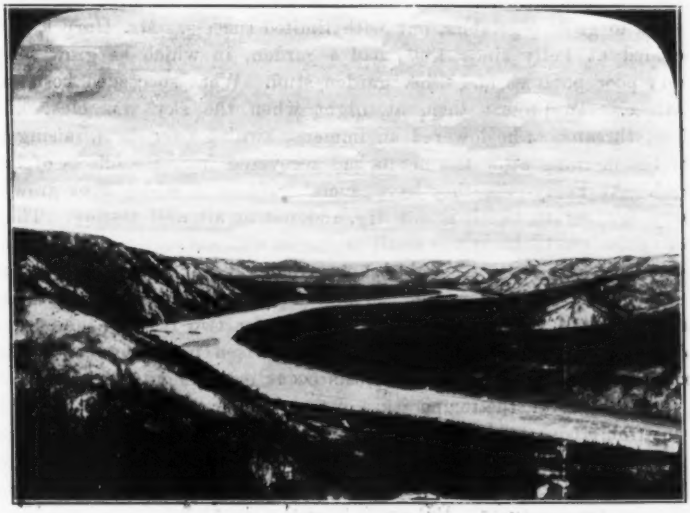
Two or three others of less importance have been discovered and located, but, as far as I know, with the exception of the doubtful one mentioned, none very rich have yet been found. But I have no doubt that improved transport facilities and improved methods of mining low-grade rocks will yet render these important and valuable.

On Lake Bennett I have picked up specimens of gold-bearing rock that have assayed very small quantities, hardly worth mentioning, but it shows it is there. The same remark can be made of many other places, needless to mention now. Miners speak very hopefully of quartz discovery on the Stewart river. They say that the rock at the head of its waters looks very well, but they have not brought in anything to show what it is worth. Heretofore there has been no chance of developing any of this property, the freight on mining machinery would often cost two or three times the worth of the machinery itself. You have to take it from some point on the coast some 3000 miles to St. Michael's, and then some 1600 or 1700 miles or more up the river, which makes it cost from 125 to 130 dollars per ton, and heretofore the transport facilities there have been altogether inadequate to keep up the proper supply of provisions. Year after year many of the men who have gone there had to come back in order to live over the winter, owing to the dearth of provisions. As soon as the Teslin road is finished, that trouble will be wiped out. On Forty-mile river there are deposits of galena carrying silver as high as 34 ounces to the ton. A line drawn from near Dawson, down the valley of the Yukon, to within a short distance of Forty-mile, shows indications of copper all along.

From the vicinity of the boundary on the river, a high range of mountains of cretaceous limestone runs in a south-easterly direction for more than 100 miles. It is much the highest and best-defined range in that part of the country, and, as far as I have seen, in the Yukon valley. Along the westerly base of this range a deposit of very superior lignite coal is found, at some points very convenient to the river, and nowhere I have seen or heard of difficult to develop. When facilities are convenient for working the quartz before mentioned, the necessary fuel will not be far to seek.

Now I will tell you something of the timber resources of the country. Beginning at the head of Lake Bennett, you have scrub timber, pine (or

spruce), and poplar, as it is known in that country. I won't give you botanical names, as it is only wasting time. The trees are small and scrubby, generally useless for anything but firing. By long and extensive searches you may find a tree here and there suitable for making boats, such as are used on the river—that is, large enough to yield planks 6 or 8 inches wide. As you get to the foot of this lake, the timber increases in size; but the number of fair-sized trees, that is, from 8 to 12 inches diameter, is very limited. At the foot of Lake Marsh, the timber is really of service and valuable. But the only place you find it is adjacent to the river; away from the river, 100 or 200 yards, you



Meridian.

LOOKING NORTH ACROSS YUKON RIVER AT 141st MERIDIAN OR INTERNATIONAL BOUNDARY-LINE, DECEMBER, 1895.

can only find small scrubby trees that are growing on eternally frozen ground through a thick layer of moss, and the result is you will see many trees 2 or 3 inches in diameter, that are probably two or three centuries old. As you go up the hillside it gets thinner, until at an altitude of 1500 or 2000 feet above the river, you are out of the timber altogether, on the bare rock of the mountain-top. That condition holds until you get down to the Yukon flats, when the timber begins to thin and gets smaller and thinner, until you get to within 300 or 400 miles of the mouth, where there is no timber at all. It is simply shrubby, and from there the steamers have to depend on the driftwood, brought down the river annually from above. Take the best part of this timber area, and trees 15 or 18 inches in diameter are scarce, and you seldom

find one 20 inches. At the boundary, when I wanted to erect my transit, I wanted a tree 22 inches, and after a three days' search by five men over a radius of 2 miles, the largest tree we found was only 18 inches in diameter at 3 feet above ground.

Now as to its agricultural value. A pamphlet was issued by the Director of the Central Experimental Farm at Ottawa not long ago, on the agricultural possibilities of the Yukon district. One of our newspapers, in a review of it, said that the director had issued a pamphlet on the agricultural possibilities of the Yukon, the most characteristic feature of which was, that the Yukon district seemed to have no agricultural possibilities at all. At one or two points attempts have been made to grow vegetables, but with limited success. Mr. Harper, who resided at Pelly since 1891, had a garden, in which he grew some very poor potatoes and other garden stuff. What succeeded best was lettuce. To protect them at night when the sky was clear and frost threatened, he lowered an immense awning over them, raising it in the morning after the plants had recovered from the effects of the cold. At Forty-mile they have several gardens in which they grow a very fair potato, but it is not dry, and not at all well tasting. They also grow good lettuce and small cabbages, which is very much relished, because it is the only vegetable supply there, and at present you cannot import any. This shows conclusively one need not count on anything in the way of agriculture as food-supply; for two reasons, the extent of available soil is very limited in comparison with the rest of the country, and it might be said frosts occur every month in the year. Close to the river, the temperature of the water from June to September runs from about 46° to 56° or 58°. Of course, the proximity of a large body of water at those temperatures considerably aids vegetable life and helps its development close to the river, because it moderates the adjacent temperatures. But away from the river a mile or so, you have serious frosts every month in the year.

The ice in the river breaks up generally about the middle of May. After breaking it runs very thickly for two or three days, when it begins to thin out and flow less and less, until at the end of a week it is clear enough for steamers, though small boats could navigate it sooner, especially if going down. There are only about three and a half months in the year during which you can go to St. Michael, for the reason that Bering sea does not open much earlier than July 1, and the river closes middle of October. In 1896 it was July 7 before the steamer could approach St. Michael. Ice freezes on the river to a thickness of 4 feet and upwards, and it takes a great deal of force to break it, and when it does break it drives for long distances in big cakes, and the river is so jammed with it that it is one of the most terrific exhibitions of force to see the Yukon river a few hours after the ice breaks. Often it stops altogether by jamming

METEOROLOGICAL RECORD IN THE YUKON DISTRICT.

Year.	Month.	Temperature.				Number of Times.								Remarks.
		Mean minimum.	Mean maximum.	Highest.	Lowest.	32° and below.	Zero and below.	−16° and below.	−20° and below.	−30° and below.	−40° and below.	−50° and below.	−60° and below.	
		°	°	°	°									
1887	Aug.	39·9	—	—	21·6	4	—	—	—	—	—	—	—	
,,	Sept.	31·7	—	—	16·0	18	—	—	—	—	—	—	—	First snow on the 23rd.
,,	Oct.	18·5	—	—	4·0	31	—	—	—	—	—	—	—	First ice running in river on 21st.
,,	Nov.	− 5·1	—	—	−24·1	30	22	12	3	—	—	—	—	Ice set in river on the 15th.
,,	Dec.	−33·6	−27·6	10·5	−55·1	31	31	29	26	19	14	4	—	
1888	Jan.	−25·3	−15·3	13·0	−53·5	31	27	23	19	16	7	3	—	
,,	Feb.	−16·8	− 4·3	24·2	−52·7	29	24	17	11	7	6	1	—	No readings were taken on 3rd, 4th, 6th, 7th, and 8th.
,,	March	−11·5	—	—	−52·7	26	19	13	6	5	4	1	—	,, ,, 11th.
,,	April	−20·4	—	—	−37·7	29	28	23	13	7	—	—	—	Max. temp. was not taken on the 3rd.
,,	May	19·8	43·3	55·0	− 1·8	30	1	—	—	—	—	—	—	
1895	Aug.	40·1	—	—	28·0	6	—	—	—	—	—	—	—	No readings were taken from 1st to 9th.
,,	Sept.	30·9	—	—	21·5	18	—	—	—	—	—	—	—	
,,	Oct.	19·4	—	—	−12·7	29	1	1	—	—	—	—	—	
,,	Nov.	4·2	11·9	38·5	−36·3	30	12	3	1	1	—	—	—	Ice set in river on November 22.
,,	Dec.	−18·2	−13·8	6·0	−55·4	31	29	20	10	6	3	1	—	
1896	Jan.	−41·9	−33·0	6·0	−67·9	31	31	29	25	24	15	12	5	
,,	Feb.	−25·5	−11·6	32·0	−64·8	29	27	24	16	11	10	2	2	
,,	March	− 2·4	18·1	39·5	−37·3	31	20	6	3	1	—	—	—	
,,	April	2·0	24·0	49·0	−28·4	28	15	10	8	—	—	—	—	
,,	May	28·8	48·7	62·0	5·0	18	—	—	—	—	—	—	—	
,,	June	39·8	65·1	80·0	27·8	4	—	—	—	—	—	—	—	
,,	July	44·5	68·9	81·0	33·0	—	—	—	—	—	—	—	—	
,,	Aug.	42·1	62·6	76·0	27·2	2	—	—	—	—	—	—	—	
,,	Sept.	34·3	50·5	63·0	4·8	8	—	—	—	—	—	—	—	
,,	Oct.	20·2	32·9	51·0	− 1·0	27	2	—	—	—	—	—	—	
,,	Nov.	−14·7	− 6·0	22·5	−38·0	30	23	18	13	7	—	—	—	
,,	Dec.	−17·4	− 6·5	11·0	−44·5	31	28	19	11	7	2	—	—	
1897	Jan.	−24·0	−14·0	10·0	−55·6	31	27	21	16	13	9	6	—	No readings were taken for max. temp. on 6th, 7th, 8th.
,,	Feb.	−12·3	0·6	31·0	−36·0	28	23	14	9	2	—	—	—	No readings were taken for max. temp. upon 16 days.
,,	March	−14·7	—	—	−54·3	30	21	15	12	8	5	3	—	,, ,, on the 28th.
,,	April	18·1	—	—	− 5·0	27	1	—	—	—	—	—	—	,, ,, ,, 4th and 5th.

in some sharp bend; the waters are dammed, rise, and when sufficient height is attained it breaks away again, leaving vast piles of ice along the banks, which are not melted away for more than a month. The upper part of the river opens sooner than the lower, but generally it may be said the whole river is open to navigation about June 1. Ice begins to form again in the river about the middle of October, and continues to accumulate until about the first quarter of November, when it sets, and the river is covered with ice—not smooth as we see it in more southerly latitudes, but rough and broken to such a degree that travel over it is in most parts impossible until the winter storms have drifted the snow into the spaces between the blocks of broken ice. Then travel is possible, but often very tedious and laborious. Each of the three winters I spent in the country accumulated about the same amount of snowfall, averaging nearly 3 feet. It is needless to say no melting occurs between October and April, with the exception of a very little in March in well-sheltered spots facing the south, but, as this is only local, it does not affect the general mass in any appreciable way. The snowfall is pretty evenly distributed over the seven months, October to April inclusive; but, as far as my observations go for three years, there is a predominance in October, November, and February. June, July, and September appear to be the wettest months. June, July, August, and part of September are the growing months. The subjoined synopsis of my meteorological records will give an idea of the prevailing temperatures.

Before the lecture, the PRESIDENT said: The distinguished member of a topographical survey of Canada, who is with us this evening, has not now been heard of by this Society for the first time. You have known of his work for the last ten years, and I think it was in the year 1891 that the Council awarded him the Murchison Grant for his distinguished energy and ability in conducting the survey of the region which he is about to describe to us—the basins of the Mackenzie and of the Yukon. But this is the first time we have had the pleasure of welcoming him amongst us, and I feel sure that he will be cordially received by this meeting. I will now ask Mr. Ogilvie to deliver his address to you.

After the lecture, the PRESIDENT said: Does any one in the meeting wish to address us or ask any questions? If not, I will remark that this region of the Yukon and the Lower Mackenzie was almost entirely unknown before Mr. Ogilvie was sent there to survey it in 1887. I believe there were two Hudson Bay forts established there in about 1846, but they were afterwards abandoned, so that when Mr. Ogilvie began his examination of this country we may look upon it as having been practically entirely unknown. He has surveyed it, and several years ago gave us an interesting account of it. The greatest calamity that can happen to a country is a war. The next greatest calamity, in my opinion, to an inhabited country is the discovery of gold. But we must confess here that both the operations of war and the discovery of gold have always been a great advantage to geographical science. It has been so in the present instance. I doubt whether, if Klondike had not become so famous, we should have had the great advantage of the presence of Mr. Ogilvie with all his numerous photographs this evening, and I

also doubt very much whether he would have had so large an audience. We have, I think, a great deal to thank him for. He has described to us the physical characteristics of the country in the most graphic way. He has shown us what its capabilities are as regards its minerals, and what its incapacities are as regards its vegetable productions. It appears, from what he has read to us about the temperatures, that this country is about the coldest in the world; for a registration of −67·9° is very rare. I myself served in the arctic regions, and we never registered lower than −50°. I believe the lowest ever registered was in Siberia, and this was lower than −68½°. Still, thermometers are liable to error, and I suspect you have found in the Klondike district about the coldest region in the world. Mr. Ogilvie has illustrated his address by a most interesting series of views, which have given us an admirable idea of the country he has described. Both for what he has told us, and for his remarkably interesting illustrations, I beg you to pass a very cordial vote of thanks to Mr. Ogilvie.

Mr. Ogilvie: I just wish to return my acknowledgment for your vote of thanks. I rather thought myself that I was a little dry on the subject. I have been troubled with a sore throat since I came to London, and it has bothered me a great deal this evening. I thank you for your attention and the patience you exhibited. I hope at some future date I shall be able to talk under better advantages, and show you other and perhaps better pictures—I won't say that, but just as good.

EXPLORATION IN THE YAFEI AND FADHLI COUNTRIES.*

By MRS. THEODORE BENT.

The first place we went to last year (1896), when we left England, was the island of Sokotra, because, as we had made two attempts in 1894 and 1895 to penetrate the Mahri country and been foiled, my husband wished at least to visit a colony of the Mahri, or Mehri, and study their manners and customs as much as he could; though, of course, their circumstances and surroundings must necessarily differ much from those of the mother country. My husband wrote an article in the *Nineteenth Century* on that island while we were in Aden preparing for a journey into the Yafei country. Our preparations for this expedition were made under quite different, and much happier circumstances, to those which attended our last journey from Aden to the interior of Arabia, *i.e.* the Hadramut. We received every help that could be given us by General Cunningham, Colonel Hayes-Sadler, Captain Wadeson, and, indeed, every one from whom we asked assistance was most kind. We took with us only our servant Manthaios, the Greek who has travelled with us so many years; Musaben, an elderly man from the Aden troop, as jemadar or general manager of the soldiers and go-between generally; and three or four soldiers. No interpreter was necessary, I am glad to say, this time.

We left Sheikh Othman on February 28, 1897, for our nine hours'

* Map, p. 112.

ride to Bir Mighar, sorry to have to make so long a journey the first day. At first we went past pretty gardens and villas, but soon left these traces of civilization behind us, and the way went through desert, sometimes sandy, sometimes bare, and sometimes with low bushes; now straight, and at others wending among sand-hills with cliffs to leeward. In some parts every trace of path was smothered by sand, and quicksands also must be warily avoided. We passed the ruins of an old town near Sheikh Othman, and 5 miles on, Imad, a wretched-looking collection of brushwood huts round a dar, or tower, still in English land. A few patches of ground had the sand scraped off into banks, and was awaiting rain to sow some crops for fodder, but looked as if they had

THE HAGHIER MOUNTAINS, FROM SUK, ISLAND OF SOKOTRA.

been waiting a long time. This caravan road across the Abyan is very old; its monotony is inexpressible for the nine hours to Bir Mighar. At the sixth hour the road to Hawash goes off to the left. As we approach the well the signs of population increase, and there are a few scrubby acacias. There are two wells a mile apart; the further, where we encamped, was once protected by a fort, now in ruins. A few years ago a hundred Yafei surprised the Fadhli, and sacked the fort, which has not since been repaired. Many parties of travellers were gathering round this well for the night; one husband and wife who took alternate charge of a baby slung in a straw cradle and a goat; another pair with their household goods, baby, and many fowls on a camel, while they were each laden with more fowls.

We passed a cold night, and were very tired; our things, having been packed on board the buggela we came from Sokotra in, were not in marching order. We only made a short journey of 6 miles next day past Al Khabt, which was just the same sort of place as Imad. We had to take a most circuitous route to reach it, and it was hard to realize that all the banks we wound amongst were fields waiting for rain.

Hagheri Ask was even a yet more wretched hamlet—about six reed huts, and about as many goats and jackal-like dogs.

Our tents were most unsteadily pitched on sand. There is a good well, and there has been a village here "from the first," as the Arabs say. There are many traces of antiquity; and many pieces of glass, good pottery, and bangles lie about. There are three ruined tombs and some smaller ones of mud bricks, and they make mud bricks there still. The villages of the Abyan are most poverty-stricken places.

The first day we had our camels loaded with joware, and at Bir Mighar we took up fuel. From Hagheri Ask to Khanfar is about 6 miles, and we spent two hours over it. Trees became more numerous, and good large ones, chiefly arrack and acacia, and a few small fan palms. There were quantities of birds' nests, in every way a contrast to ours,

FROM YEHÀZAHAZ, LOOKING OVER THE PASS TOWARD ADAHAN, SOKOTRA.

for, instead of warm woolly ones, safe from wind and rain in the innermost recesses of our soft-leaved, easily climbed trees, these were loose open-work airy little baskets dancing on the outer tips of the thorny branches. When we reached the Wadi Banna, or Benna, the boundary between the Beled Fadhli and Beled Yafei, winding indeed was our way, for we were in thick wood; swords and daggers had to be used to cut a path, and we were brought to a standstill more than once, with our heads bent under trees, not daring to lift them. It would be easy for the inhabitants to stop an enemy's attack here. The smell of the arrack is not at all pleasant. Two Fadhlis were once directed into the Banna bed by the Yafei of Al Husn, and when in the wood they set fire to it and burnt them. The inhabitants do not venture off the path.

We encamped not far from the town, amongst some large arrack bushes on the sand, and surrounded by mounds scattered over with bits of glass. There has been a succession of towns here, and the present town is situated on large mounds near some somewhat ruinous forts.

It would take an immense quantity of digging to come on Himyaritic remains. Many gold coins are found, and set on the jembias; our old Musaben had two on his dagger, about four hundred years old. Boubakr bin Saïd, Sultan of the Lower Yafei, was to come in two days to keep the feast of a saint buried here. In the mean time we surveyed our surroundings. The ground under the arrack bushes is perforated through and through by rats with bushy tips to their tails, as far as the utmost branch extends. Sometimes we felt our feet sinking, and discovered we were walking over the site of a vanished bush. There is an old ruined castle, with pretty herring-bone patterns and open-work windows. The principal well, a little distance from the town, is very close by the present fortress, where the sultan lives. There is a gunpowder factory of a primitive kind, for there is plenty of saltpetre to be found close by. We went all about the village quite comfortably with a couple of Yafei guards, and the people were civil. We saw curious ovens, like pots with lids, and oxen returning with the dustpans they use for scraping the sand off the cultivable soil, and many preparations for the feast in the way of food and very smart new indigo-dyed clothes. Photography, sketching, and unpacking the gifts for the sultan occupied our time. The mosquitos were awful. The sultan came to visit us very suddenly in the afternoon—a rather handsome, sly-looking man. He brought some honey, and made himself most agreeable till we spoke of going to Al Kara. He immediately began to speak of danger. He read the letter of introduction with more discretion than I have observed in any of the Arab sultans I have seen. Instead of reading to a crowd of slaves, he banished all but one very confidential, though dirty man, and read this letter and one previously sent. When he left, my husband told him the sooner he sent a message as to the possibilities of going to Al Kara the better it would be for him; and we also told Musaben to tell the Bedous there would be money for them.

It appeared, after much fruitless negotiation, that the sultan was determined to do the Bedous. He arrived very soon after breakfast, *i.e.* before seven, and demanded 500 Rs. for himself, which he immediately lowered of his own accord to 400 Rs., and gave us to understand danger would be averted if we paid this sum. He carried off 100 Rs. for coffee and a bundle of turbans and other garments. No one but Musaben was to know of the money, and the fat parcel he himself stuffed into the clothes of his dirty confidant, explaining to us and them that he should only show an aluminium box as his sole gift, and walked off holding it ostentatiously between his finger and thumb. Later we walked round the castle, and were let into the courtyard. The sultan saw us from a window in his tower, and beckoned us up. We had to go through gateways on all sides of the tower, so that they can quite command the entrance. We went up a high winding stair to a room about 10 feet square, where we sat on the floor and had coffee with cloves and no

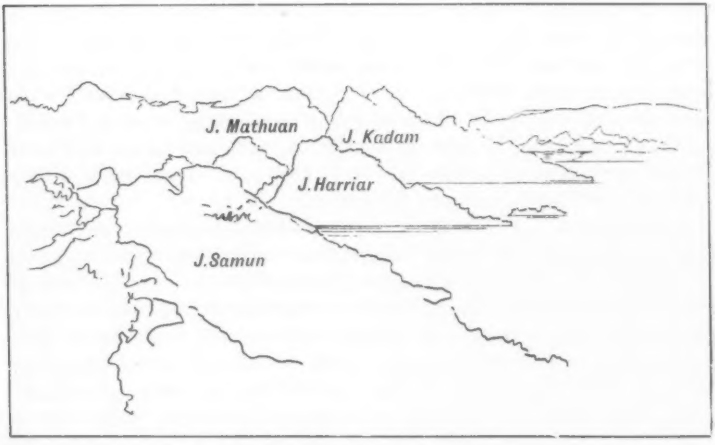
sugar, and a coarse kind of sweetmeat. His first question was, "Where is the gun?" I said, "Where is Al Kara?" So he laughed merrily, and said, "You shall not go to Al Kara till I have the gun." So I told him he should not have the gun till we had been. He then told my husband he must pay 1000 Rs. and the gun first, and he would manage the Bedous; but my husband said he would pay afterwards, and not more than 400 Rs. So this conversation went on, and we left. Musaben was surprised that we had been admitted.

We spent our days taking long walks in the cultivated fields, stepping on banks between the canals, or abrs. There were many trees, and acres of dukha grown for making oil, gilgil, and other crops; and the shade, the birds, the greenery, and water made it a pleasant relief from the sandy mounds. The workpeople are slaves of the subordinate race of Hagheri. There are really very few Arabs. Watchmen or scarecrows, with long canes, stand on high platforms scattered about. The old well has very-much-worn stones round its mouth, and had once an extensive building over it. Corn is ground in a mill made from the hollowed trunk of a tree, with a camel going round and round. It was amusing to see the little children with their arms held aloft bound up in leaves to their elbows, to keep their hands nice, as they had been dyed with henna for the festival.

Jebel Gabeil is the acropolis of the ancient Khanfar, about 200 feet high and a quarter of a mile long, with a double fort on the top, containing an area of about 100 square yards. The outer wall is built of fine large stones, and the interior has a beautiful foundation, evidently Himyaritic, and commands an extensive view. The tomb of the saint whose feast it was is surrounded with tombs, all in disrepair, but covered with very pretty carved wood. The procession passed our camp both going and coming, and was an interesting sight. Quite early I was begged to come out and see crowds of women and girls, who had come to visit me with their new clothes, some indigo and some of red ingrain. They wear the same shape as in the Hadramut, but do not cover their faces. They wear a good deal of jewellery, and paint their faces yellow. I did not see any of the fantastic patterns I saw in the Hadramut on the faces. First came four men with lances, dancing to and fro, then the sultan on a camel, dressed in red and purple and gold, and after him about thirty soldiers. A large white and red flag followed. On his return the sultan stopped and delivered a short address; the bystanders assenting by shouting "Nahm! Nahm!"

The Sultan came constantly, always raising his demands. Finally, when he could not get what he wanted, and we saw it was not safe to trust ourselves in the hands of so shifty a man, he became so insistent that my husband told him "he had seen enough of him; he might leave our camp; we would not travel with him." Off went the sultan in such a hurry that he left his stick behind, and sent us a message that we

were not to pass another night in his country. We sent back a message that we would not stir till morning. He came early himself to say we were to go back over the Wadi Banna, and not the shortest way to the Fadhli country, unless we gave him more money. We would not speak to him ourselves, and let him see the greatest amusement on our part. When we did go, we only went a very little way in the prescribed direction, then turned round, our army being a rearguard rushing up hillocks to watch for pursuers. We reached Al Khaur, a village with many ruined castles, and camped in frightful dust. The Wazier Abdullah bin Abdurrahman had been sent by the Fadhli Sultan to welcome us. He proved a very agreeable travelling companion. He is young and refined looking.

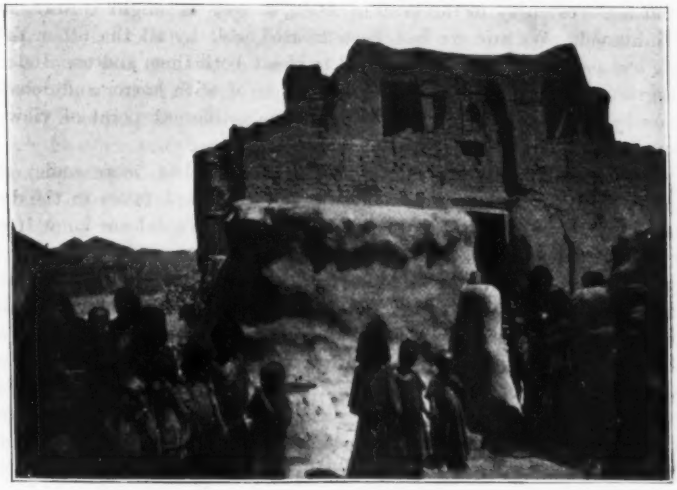


FROM JEBEL SARRAR, LOOKING NORTH-EAST.

We saw a great deal of cattle about. There is a sheer rock overhanging the village 1000 feet above the plain. Theodore ascended Jebel Sarrar to see the ruins. A fine paved road, protected by forts, climbs up past a curious square stone said to be full of money, and goes zigzag through a narrow gulley like the walls at Zimbabwe. At the top there is a very strong fortress with many walls, and three cisterns just like the smaller of the tanks at Aden, with steps down into them, all covered with cement. This has been a very strong fortification, protecting and overlooking the whole of the Abyan from Jebel Goddam beyond Shukra to Jebel Shemshan at Aden. The following day we started for Dirgheg. The country is all irrigated by water brought from Masana by a channel called Nazai. At the corner of the Wadi Hassan the abrs branch off in every direction. The sources belong to

the Yafei, and the Fadhli pay them annually 25 Maria Theresa dollars, a basket of dates, and a turban for the sultan, but the management is in the hands of seyids in *inam* for ever, they being supposed to be neutral, for fear a war might produce a drought. Still, in time of war the water often is cut off. The banks of the abyrs were full of castor-oil bushes, cotton myrtle, tamarisk, all smothered with a pretty creeper with yellow flowers and little scarlet gourds.

Dirgheg lies just on the left bank of the Wadi Hassan in an almost desert place. There are many dars, or towers, where the wealthy Arabs, of whom there is a considerable population, live. The servile tribe of Hagheri live in reed huts; we saw them thrashing gilgil and



HOUSE AND OVEN, DIRGHEG, BEHD FADHLI.

vetch. There are a market and a few shops. I had no trouble about taking photographs. Once, however, one of our attendants asked a man to move out of my way, and gave him a little push. Out he pulled his ghembia, and there was a scrimmage very dangerous to my camera and its appurtenances, as they were going to be used as weapons of defence. I rushed into the midst, and they stopped fighting to tell me not to be afraid, and peace was restored. I think it requires some courage to plunge out of the tent into the burning sand with the camera, but it never seems so hot once one is out. We were given over by our soldiers to the charge of two inhabitants of Dirgheg, and were quite elated at hearing on other authority than our own, "They can speak Arabic."

We had on our return the delightful pleasure of a letter from Sultan

Boubakr, making another try for the gun, and saying he would come and take us to Al Husn. The messenger was fetched, and scornfully told by my husband that it was too late; we would not think of travelling with so bad a man. I said, "You have a great thief for your sultan, and a great liar," and told him all about the money and clothes he had secretly taken; so, no doubt, he had to disgorge some, after all. Musaben laughed very much, and said my imitation of the sultan's manner was so good he must get two sheikhs to hear the Bibi mimic the Yafei Sultan. The Yafei messenger was much interested. I told the whole story, and how we had gone round three trees and departed our own way, adding, "The sultan could see us from his own castle;" and he said, "Yes, he did." We told him all his conduct was written down and sent yesterday to the Wali of Aden, so now he might be sorry and frightened. We said we had been treated well by all the other Yafei we had met, but the sultan wanted to cheat both them and us. Indeed, it grieves us to hear the kind Yafei spoken of with horror and detestation by the Fadhli, but no doubt they have a different point of view to ours.

We went to another village called Abr Shebba, more under the mountains. We were shown about very civilly, and taken to the door of a large dar, and asked if we wished to go in. We did not know if we were wanted, so made an indefinite answer. There was a difference of opinion, and at last they said the Bibi should go in; so I crossed the court and entered the house, and had hardly done so when my hand was seized, and I was dragged by a man through black darkness round and round. I stepped high, and as quickly as I could rushed after him. At the third round I saw a little light shining on the roughest possible earthen steps, and was pulled into a little room, where I was greeted with cries of amazement by some women, and then continued my way unaided to the top of the tower. The parapets were ornamented with gazelle horns. After some time I wanted to go down, but I was on my way taken to a large room where manners demanded I should settle down for coffee. Every one was very kind, and for greater friendliness a naked baby four months old was placed in my hands. When I wished to return it it was made to sit on my knee. It soon kindly cried, and was, to my joy, removed. It had never in its life been completely washed, though several large spots and trimmings had been painted on its head. Theodore joined me at last, and had coffee too.

The first thing next morning, before our departure to Al Ma'a, another letter came from the Yafei Sultan about Al Husn; but the messenger was told that once was enough to see that great thief (Harami), and he could take the letter back. It was 14 miles to Al Ma'a, and took us six hours. We passed up the Wadi Hassan, and saw Al Husn in the distance. We did not go quite to the corner where the Wadi Hassan turns east. It is considered too near the Yafei frontier to

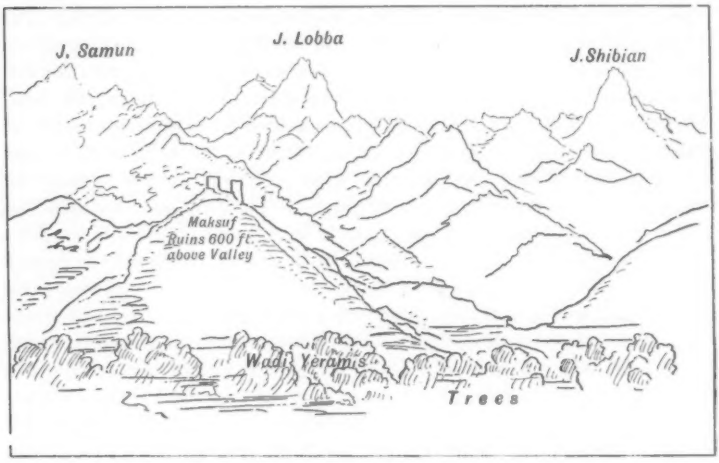
be safe, and the Fadhli always use a narrow pass called Tarik al Kaha, going round Mount Gherash. It gets narrower and steeper as it goes on zigzagging up slabs of shale, with only room for one camel at a time. There are any amount of ambush places, especially on the north. The pass goes uphill, west to east, and the steepest end is at the east. A spur runs out west on the north side about 50 feet high, convenient to shoot over. The approaches are quite open. It leads through Wadi Goddam to Wadi Hassan, and at the entrance to Wadi Hassan, Fadhli Bedous are for ever stationed to watch for Yafei attacks on a tiny jutting hill. Three men of ours, sheikhs who had come to meet us, galloped forward to explain to them who we were, and ascertain that all was safe. They fired a gun over our heads. We saw several baboons. We saw several little heaps of stones, and were told they marked spots where Fadhli had been shot by Yafei. A very large heap is formed by those who pass the valley safely for good luck. We also passed the tomb of a seyid with four large smooth stones at the top anointed with oil for the Ed. Before we reached Al Ma'a the river-bed narrowed in from the other side, and along the raised bank at short intervals were watch-towers of the Yafei. At Al Ma'a they are quite close, about half a mile off at most. The country still very arid and barren, but the mountains very fine.

Al Ma'a is a wretched hamlet, which has seen very much better days. There are high ruined castles, destroyed by the present sultan, as Al Ma'a and its headman were in revolt. Now there are only three or four Arab houses and a hamlet of reed huts. The valley is about 2 miles wide, and there are four or five Yafei towers near. Our escort were very much afraid. They said that the Yafei might shoot us, though a cannon would be necessary, and lay the blame on the Fadhli, that they would by no means let us camp anywhere but in a most disgustingly dusty place next the village; and they kept sharp watch all night, talking much. The towers protect the approach to the Wadi Theba, which here goes up or comes down from Al Kara. The country round is in a perpetual state of ferment, like Germany in the Middle Ages, every one on the look-out for attacks from enemies.

We were up and off before the sun rose, our party being increased by Sultan Salem, brother to the Fadhli Sultan. He is twenty, and though not dark in colour, has woolly hair. He and the soldiers and the wazier, Abdullah bin Abdurrahman, rode at some distance to our left, between us and the dangerous Yafei towers. The Goddam, or Kadam range, which separates the Wadi Yeramis from the Abyan, is a mass of arid peaks, none reaching to more than 2000 feet. A road leads from Al Ma'a across the mountains to the sea at Asala.

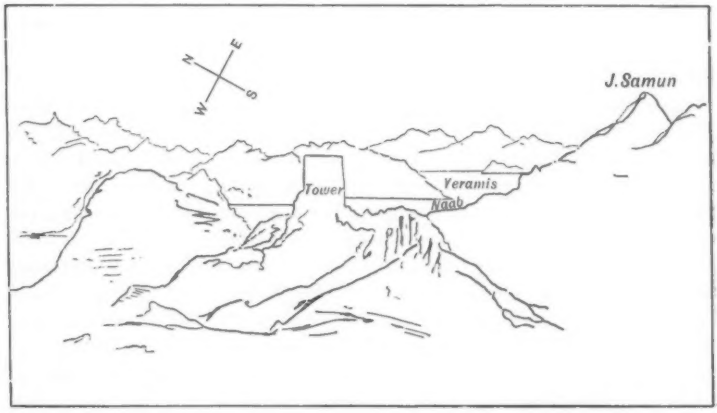
We reached Karyatel Maksuf about ten, the valleys getting narrower and more woody and grassy as we approached. There is an ancient fort on a hill 650 feet above the valley, and about 1300 above the sea,

with a glorious view over the Goddam range to the sea. There is another ruin of a round fort on the left of the valley. We went on a mile to a



VIEW FROM ABOVE WADI YERAMIS, LOOKING SOUTH-EAST FROM MAKSUF.

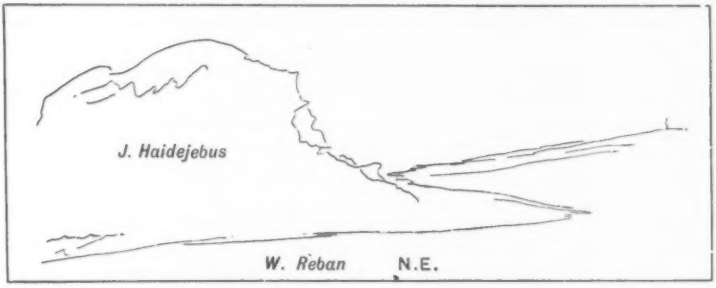
delightful place, where there were trees, water, and reeds, and beautiful views through shady glades to the mountain peaks, and many cattle.



FROM ABOVE THE SOUTH-WEST SIDE OF WADI YERAMIS AT MAKSUF.

We wished to remain there, but were told it was better to get on to Naab, as there was a little danger. We quite understood that danger was a bogy to prevent us keeping them from a town, and so we pointed

out that the Yafei were not likely to come down a light-coloured mountain-side with only a few tamarisks into a valley half a mile wide; so my husband firmly said we would stay on the clean sand. We saw many baboons. The second ruin, which is a mile further up the Wadi Yeramis than the first, is evidently Himyaritic, and protected the first town after Banna on the way to the Hadramut. It is a circular, crowning a hill 300 feet high, and enclosing a space of 50 yards in diameter. On the north-east side it is protected by five square towers, and has one gate to the south. It was the acropolis of a large town, lying in all directions, but chiefly to the north-east. It has evidently been a place of considerable strength, as the Wadi Yeramis is only half a mile wide here. There is a regular stream of water in a narrow channel, and the whole valley is green and fertile.

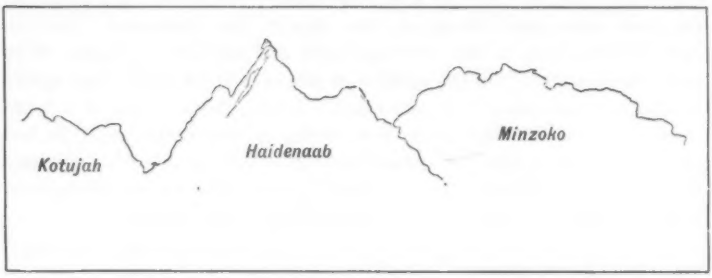


FROM YERAD NEAR NAAB, LOOKING NORTH-EAST.

The first ruin is probably Persian or later Arabian. Before we entered this narrow part of the valley, it was curious to see below the peaked mountains a flat-topped effusion of basalt, called borum, advanced forward. We made a very early start, and gradually got into a thick low wood, but as the Wadi Yeramis widened out there were only tamarisks. Our ascent was rapid, and after about an hour we turned due east, this part being very bare-looking, though there were a good many horrid acacias and also euphorbias with rounded trunks. We soon burst upon a lovely plain all mapped out in fields and abrs. It is 6 miles to Naab, and we took three hours. We passed through full 2 miles of this fertility, with three or four villages—Souat, Nogat, Arrawa, and Old Naab, with mosque, minar, and a fine old house all tumbling into ruins. Wadi Yeramis is much opened out here, and the lower part is bounded by the basalt in walls about 200 feet high, sometimes with mounds within them again, and hillocks of the same formation as the high mountains. This cultivated paradise is the property of Sultan Ahmet bin Salem, brother of Sultan Saleh of the coast, and may be said to be the pick of his whole dominions.

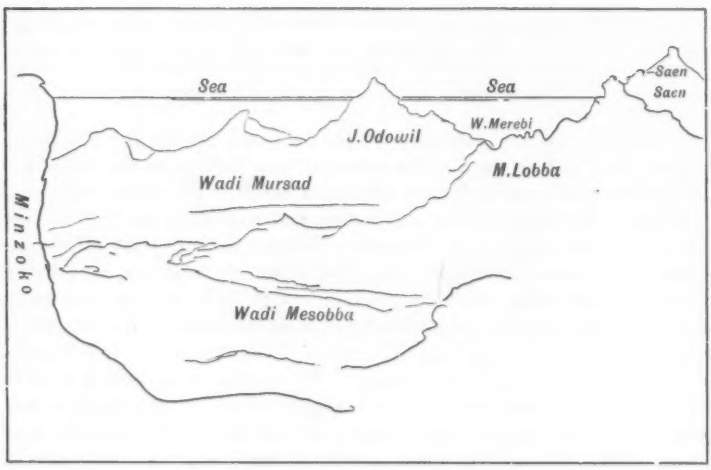
Arrawa has twenty-four shops, and the sultan gets half a real (or

M.T. dollar) on all merchandise camels going up to the Beled Yafei. There were many bales of merchandise in a sort of custom-house when we arrived at this great centre of inland traffic. We encamped on the opposite side of the Wadi from the town, which is perched on a raised



FROM HAIDEJEBUS.

plateau of earth banks. When we halted, and had climbed up, there was a line of people waiting to salute us. We and Sultan Salem walked in front, our eleven men with guns walked behind, singing a Merghazi, or salutation song, of which I have a copy. We halted again, and



FROM HAIDENAAB, LOOKING SOUTH-WEST.

they fired ten salutes; then we advanced again, Sultan Salem leading, when twenty of the local sultan's soldiers came forward and kissed his hand and shook ours. Then there was a refreshment of five or six cups of coffee and ginger, very weak, on the floor in a tower. There was

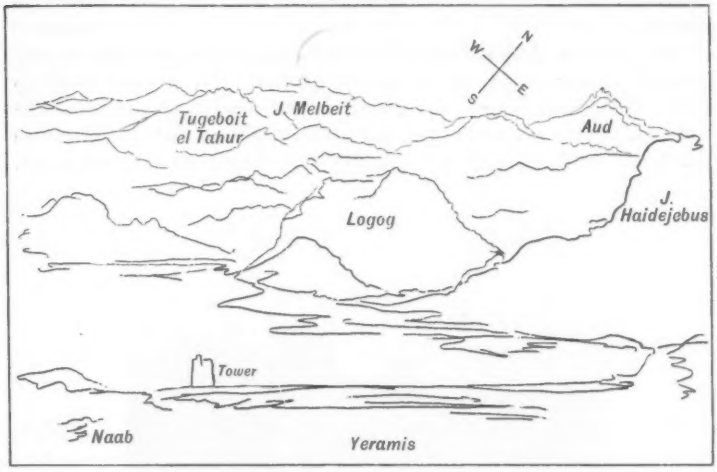
milk in the first cups, but it became exhausted. We never saw the sultan all the time we were there, for they said he had a wound in his leg.

The earthen cliffs are about 30 feet high, and we had to go a very roundabout way to get up by narrow gullies. My husband went up a hill, Yerad, just behind Naab, with an old Arab fort on it above the Yeramis, which ends here; then begins Wadi Reban, with a clear course north-east for 3 miles, then north, and then a long stretch east again.

SHEIKH SEIL AND SULTAN HAIDAN, SON OF THE SULTAN OF NAAB, IN NAAB CASTLE.

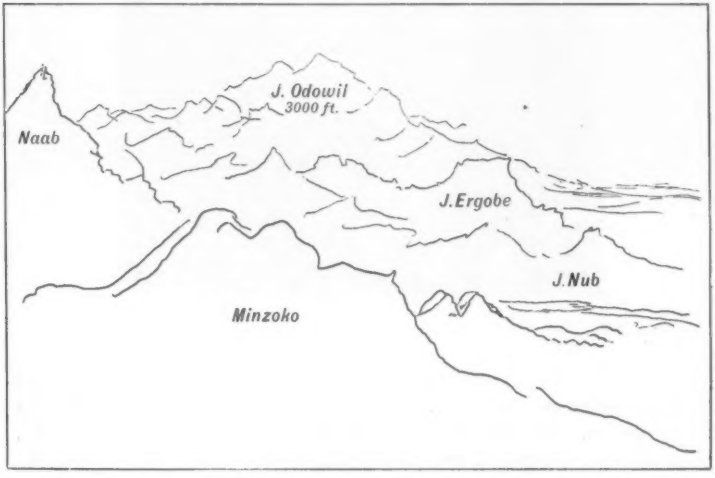
There was a lovely view over the Yafei mountains on the north, and Goddam range on the south. A Bedou who went with him told him all the names. Though he could understand when they talked to him, he could not understand two talking together. The Sultan Salem bin Saleh's old abandoned castle has some nice decoration about it. They left it because there were so many jinni (*i.e.* ghosts) in it. Our informant had not seen them, but only heard of them. March 12, he went up what he thought was the highest mountain of the Goddam range,

Minzoko, just behind Naab, and made it 2000 feet, but considered its



FROM HAIDENAAB, LOOKING NORTH-WEST.

neighbour Haidenaab 300 or 400 feet higher. The Tarik Minzoko goes between them.



FROM SHARIAH, LOOKING SOUTH-WEST.

Our party was now increased by another "prince," Sultan Haidar, son of the Sultan of Naab, a person delightful to contemplate. He was

got up in Bedou style; his hair, fluffy and long, was tied back by a fillet, and stuck out in a bush behind. He has a curious countenance, and very weak eyes. He was wrapped in a couple of large blue cotton cloths with very long fringes, half a yard at least. The cotton is plastered with indigo, even beyond the dye, and when calendered, as they are when new, gleam purple and red. The richer you are the bluer you are, and Sultan Haidar was very blue indeed. The curious thing about these blue people is that, as the prominent parts of the face and body are the darkest, there is an odd inside-out effect.

When we left Naab we turned into the Wadi Reban to Shariah—three hours and ten minutes, 7 geographical miles, 4 north-east and 3 north

OLD NAAB, SHOWING WHERE WADI REBAN GOES ON FROM WADI YERANUS.

—and ascended 350 feet. Wadi Reban is a quarter of a mile wide near Naab, but after 2 miles opens out; and there are gardens, and now and again running water appears, and plenty of trees. At the fourth mile, near a fort, we turned sharply to the north, past Jebel Riah, where Wadi Riah comes in, and then reached a wide open space, where Wadi Silib joins in and there are no less than four old villages, called Shariah. Jebel Shaas was beyond us, very high, and Wadi Ghiuda to the right. This large open space is girt with mountains 500 to 5000 feet high, and is a great junction for the waters from Wadis Reban, Silib, and Ghiuda. It was once exceedingly populous, and considerable towns were perched on the rocks, forming gates to the Wadi Silib, and two others at a great elevation on the opposite side. The cause of the decrease in population

in Arabia must be the constant intertribal warfare and the gradual filling up of the valleys with sand. Great banks of sand 20 feet high line the river-beds, and wash away with the heavy rains, which contribute to the silting up. This country must have been very fertile to have supported the population, for the four towns must have been large. The stone buildings alone would make any one of the four larger than most towns in Arabia to-day, and there must have been the usual hut population. We had a very pleasant camp among trees, and had a steep scramble to the ruins.

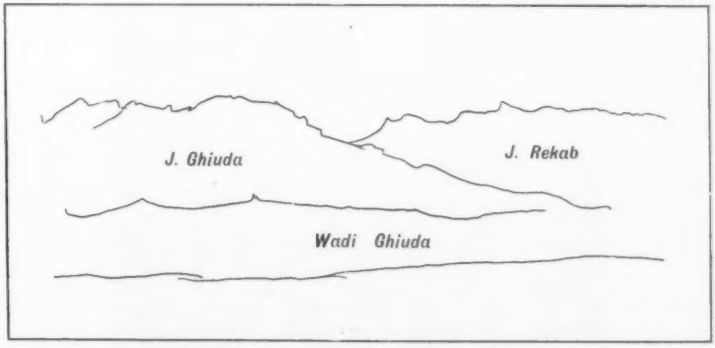
An enthusiastic geologist would have enjoyed our next day's journey immensely; we went through such a strange weird volcanic

WADI GHINDA, LOOKING EAST.

valley—not a wadi, but a sheb, narrower and shallower. The road is Tarik Sauda. The strata of the rocks are heaved up at a very steep angle, and we had to ride along smooth rocks, sometimes without any trace of a road at all among the stones; sometimes we had to make very great windings among heaps and hillocks of all sorts of different-coloured earths. Hardly a green thing was to be seen, and altogether the whole place looked dreary and desolate; but we were much interested in this day's journey among the great scarred and seamed volcanic mountains. We ascended 650 feet—very difficult indeed; the steepest part is called Akaba Sauda. We reached the headwater of the Wadi Ghiuda at the top of the Akaba, about 7 miles, in four hours, 2000 feet up, Naab, 1000 feet; to Shariah, 350; to Ghiuda, 650. We

passed Dogoter and M'Haider, mere names. We encamped on a waste of stones; no tent-pegs could be used, and it was windy and cold.

Now was our time to send by Musaben to the camp of the sultans three very gay blankets for them and Abdullah bin Abdurrahman. The long name of the wazir's father had constantly to be on our lips on account of his dignity, for they are like the Russians in that respect—common people's fathers are not mentioned. The name was marvellously shortened to 'B'd'rahman. We were thought to be in danger that night, and did not make a very early start, as we had to load up water; and we two climbed down 350 feet into the Wadi Ghiuda, that I might take



FROM CAMP BETWEEN AKABA BEVA AND AKABA SAUDA, LOOKING SOUTH-WEST.

photographs. It was so pretty, with pools of water and creepers hanging on the trees.

The sultans meanwhile sat up in their beds of leaves wrapped in their blankets. How absurd it seems that two princes and a prime minister should have to sleep out because two English choose to travel in their country! Not a word of thanks did we ever get for those blankets, but they were evidently much appreciated, for their recipients sat on their camels wrapped over head and ears in them.

We joined the camels on the way, and after two hours of stones ascended the very steep Akaba Beva. The view from the hills above—about 2500 feet—is splendid, all the Yafei mountains and the Goddam range ending at Haide Naab, and giving place to the higher mountains of Rekab and Ghiuda. We descended, not much, into the lovely Wadi Hadda, full of trees smothered with a kind of vine, with thick glossy india-rubber-like leaves; then up Akaba Hadda to the huge plain of Mis'hal, full of villages, but ill-supplied with water. There are only some very bad wells for the cattle, and they have to fetch drinking-water from afar, from Ghenab and Lammas. We engaged a Bedou's camel to keep us supplied. The plain is 2700 feet above the sea. The sheikh's name is

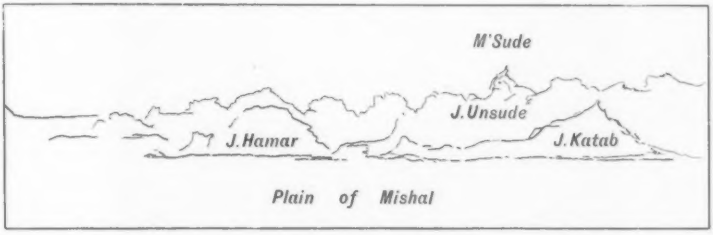
Mohommod bin Nasr, Nakai; this is the first time we heard this pronunciation of the prophet's name. He was determined to give us a grand reception. Sheikh Seil had gone forward to announce us from Ghiuda, and he came to meet us on his pony down both akabas—a fearful journey. From a distance we could see the preparations. There was a long line on the sandy plain of between two and three hundred Bedous, naked save for a blue scarf round their waists, with dagger, powder-horn, etc., stuck in. Some had guns, matchlocks, and some had spears.

WADI GHINDA, LOOKING EAST.

They mostly had their long hair tied up and sticking out in a fuz behind, as funny a long line of men as ever one saw.

We dismounted, and all our party advanced hand-in-hand, fourteen besides ourselves and Manthaios, we being the only ones who did not know the words in which to chant our response to the welcoming shout. This they interrupted occasionally by the high gurgling sound they are so fond of, constantly coming out of the rank, one or other, and firing a gun and retiring. The blue-bearded Sheikh Seil galloped up

and down in front of us, twirling his spear. We stopped 150 yards from them, and after much more firing the spearmen began to parade before us in a serpentine way, two and two, backwards and forwards, zigzag, and round and round the gunners, gradually getting nearer and nearer to us, and dragging the gunners after them, with a red flag, a seyid, and their shiekh, Mohommod bin Nasr, between them. When they got quite close they welcomed us, and we said "Peace" to them. They passed us so many times that we could see and notice them well. Some were very tall; one led his tiny little boy, and he was very lame. The lancers danced very prettily, having a man a little way in front of them executing wild capers and throwing up his spear and catching it, singing all the while songs of welcome. We could not understand more than some allusions, which assured us they were composed for the



FROM MISHAL, LOOKING SOUTH.

occasion. After many gyrations they retired to their former place, and then a herald came forward and made a solemn address of welcome.

Then our turn came, and we sent forth a line with Sultan Haidar in it to sing and let off guns. When the two lines met they shook hands and kissed, the sultans and seyids being kissed on the forehead and the upper part of the leg. When they returned to us all our party joined hands to go to our camp, now ready, a good distance, all keeping step in a kind of stilted, prancing way, singing. The spearmen in front danced with all manner of light and graceful antics, and we were nearly stifled with the dust; and the din was so appalling that we arrived quite dazed at our tents after this welcome, which had lasted fully an hour. We were the first white people who had been at Mis'hal. I tore my camera from its case to take a photograph before the people left us, and it did better than I could have expected in such a crowd, with no sun and so much whirling dust. The town consists of a low square dar and a collection of brushwood arbours, so slight that there is no pretension of concealing anything that goes on inside. We were very thankful for a large pot of coffee and ginger, sent by a sultan, and a fat lamb. The princes ventured to leave us in charge of Abdullah bin Abdurrahman, and abode in the tower. Sultan Haidar went home from here.

The tableland of Mis'hal is approached by three akabas: (1) Sauda, to 2000 feet; (2) Beva, to 2500 feet; (3) Hadda, to 2750 feet. The Nakai tribe live here, and are on friendly terms with the Fadhli—a sufficiently rare circumstance in this country. The Nakai chief can put four hundred men in the field to help the Fadhli. The Markashi are at war; they live in the Goddam range, and have been giving the sultan trouble lately.

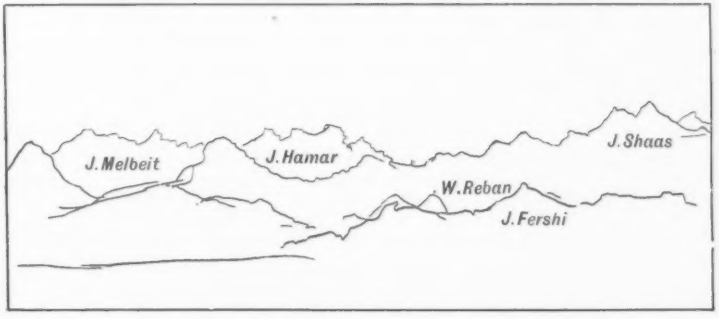
The road to Shukra most frequented is the Tarik el Arkob; eastward goes the road to the Hadramut, over the plain. Northward is

FADHLI AT SHABEAH, WADI REBAN.

the mountainous country of the Aodeli tribe, where the rain is sometimes so cold that it is hard and quite white, and the water like stone. The plain is 10 or 15 miles long, by about 4 or 5 miles at its broadest. If irrigated it would yield enormously. The well is of great depth, but the water very bad. My husband ascended a mountain about 3000 feet high, but only 400 feet above the plain, with a most remarkable view over the Aodeli mountains, about 20 miles away, towering up to a great

height—far higher than the Yafei range, which Mr. Tate gives as 7000 feet: these are probably 10,000 feet. We were not well the last day at Mis'hal.

We took advantage of the curiosity of the Aodeli, who had just arrived with a Kafila, to make them stay in our camp and question them. The El Khaur mountains look most fascinating to see only from a distance, and are inhabited by lawless tribes, who would murder any traveller who ventured among them, owing allegiance to no man, and having no wholesome fear of the Wali of Aden before their eyes; they are all Beduin. The Aodeli are a very large tribe, and say they have 4000 men for war; the Markashi can put 500 or 600 in the field; the Nakai 500; and the Fadhli 2000. Lauda, the chief town of the Aodeli,



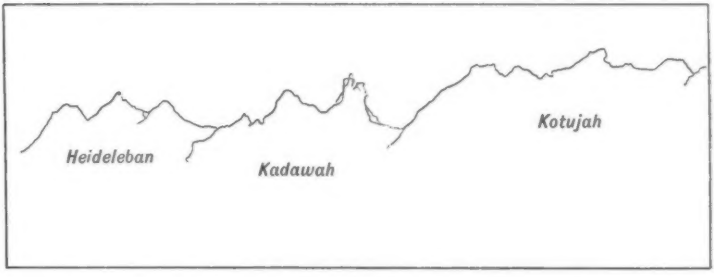
FROM ABOVE BIR LAMMAS, LOOKING NORTH-WEST.

is much bigger than Shibam; there are many Arabs. The sultan is Mohamed bin Saleh. It is six hours from Mis'hal—34 miles—and is situated below the mountains. Above it is El Betha—Sultan Saleh. Belad el Megheba, in the upper Yafei country, is under Sultan Hakam Mohamed bin Ali. Sabad el Baida Resass (where there must be lead) is not under the Turks; El Aodeli live there. Neither is Sahib Louda under the Turks; the inhabitants are Augheri. This has a very soft gutteral—the Arabic *ghain*.

Our next stage was Bir Lammas, about 4 miles off, mostly across the monotonous plain. We passed four dars and villages. In time of war Fadhli sultan comes and occupies one of these dars. We met sheikhs walking with little battle-axes on long poles—weapons in war, and in peace used for chopping wood, at all times emblems of their rank. The plain at length broke away, and we got into the narrow, and not very deep, wooded Wadi el Mimin. It has very precipitous sides of basalt, brown in colour, and making a very untidy attempt at being columnar. Bir Lammas is a great, and I must add, very dirty, halting-place for caravans going to Shukra, on the Tarik el Arkob, to El Kaur and the

Hadramut. We were encamped about 380 yards off, and thought it a very pretty place, with acacia trees and creepers making arbours of all of them. The women do all the work here, having to fetch water from Bir Lammas and Ghenab for Mis'hal. The children, up to fourteen years of age, tend the flocks, and the men stroll about or sit in very warlike-looking conclaves, with guns and spears. Young children have wooden jembias to accustom them to their use, and it is funny to see tiny urchins of three or four hurling reeds at each other in imitation of their elders with more deadly weapons. The Beduins seem born in an element of war; one we heard of had lasted fifteen years, but was happily now stopped for a little while.

The length of the Aodeli range is very striking, and must run from west to east for 30 or 40 miles, a massive even-topped range, with few breaks in it, and no peaks.



FROM WADI SAMLUF.

On a hill near the plain, about half a mile from Bir Lammas, there are ruins of goodish style, probably of the Ashabir period of Hamdani. We stayed at Bir Lammas two nights. We were to ride five hours for water. We were soon out of the wadi, and wandering over stony plains scattered over with lumps of basalt. At last we came to the Wadi Samluf, and I begged that we might stop and have a camel fetched for water. I had to be dragged from my camel, and laid in the cinder-like sand till the tent was pitched, for, as my malarial fever was constant, and I had no tertian intervals, I lost my strength completely. We both, and several others, were very ill, and we were not strong enough to get at our medicine-chest. The water was very bad. The Sultan Salem and other grandees camped at the more dangerous open mouth of the valley. I had to be carried to the sea, 17 miles, on my bed, which was strengthened with tent-pegs and slung on tent-poles. From the little sultan downwards there was not one who did not help most kindly. We went down gently 3000 feet. I cannot describe this journey, except that it was so very winding that I seemed to see the

camels meeting and passing me often. Fortunately the crossing of the low hot Abyan was short.

How glad I was to find myself in a rushing, roaring, rabble rout of men, women, and children tearing along beside me!—not a thing I generally like, but now it told me of the end of my weary journey. I was deposited on my bed in a tower, tent-pegs and poles removed, and left with a spearman on the doorstep to keep off intruders. The rest of our miserable fever-stricken party came in half an hour later. The Sultan of the Fadhli came to our tent to see us—a pleasant-faced, mustard-coloured man; his wife, too, the daughter of an Aden Sheikh, very handsome. They were very kind in sending milk, water-melons, and any little luxury they could. The sultan lives in a fine brown building with a stunted tower, a glorified Arab house, but nothing like those in the Hadramut. They send sharks' fins to China from here, as well as from Sokotra and the Somali coast. This is probably Ptolemy's Agmanisphe Kome. It is just the right distance from Arabia-Emporium, one day; so we found it. There was the greatest difficulty in getting a boat, for none of the ships wished to go to Aden, as they would be supposed to be coming from the plague-stricken Bombay, for fear of quarantine. My husband promised 100 Rs. for every day, and the sultan compelled a captain whose baggela was loaded for Mokalla to take us to Aden by refusing to give him his papers otherwise.

Our last moments at Shukra were spent lying on the sand with our heads on a bag, and sheltered by a little bit of sacking on three sticks. The sultan sat over us on a high chair, saying very polite things. We got on board our ship, at 3 o'clock, and from the ship admired Shugra, which looked very picturesque in the evening haze, with its towers, its few trees, and its many-peaked Goddam mountains behind. This is all I can write about this journey. It would have been better told, but that I only am left to tell it.

NOTES ON THE VISIT OF DR. BACH TO THE CATUQUINARÚ INDIANS OF AMAZONAS.

By Colonel GEORGE EARL CHURCH.

Dr. José Bach, of La Plata, Argentine Republic, who has made extensive explorations in the most dangerous and remote parts of the valley of the Amazon, visiting and studying the habits and customs of its savage tribes, has kindly given me some data of interest regarding a tribe known as the Catuquinarús, whom he visited during his voyage of 1896–1897. Among them, he found in use a peculiar telegraphic instrument, herein described, and which they call a "cambarysú," a sketch of which accompanies this paper.

Dr. Bach says, "These Indians come from the frontiers of Bolivia and Perú, and occupy the lands between the rivers Embyrá and Embyrasú, which empty into the river Tarauacá near the river Jatuarana-Paraná. The Tarauacá flows into the river Juruá. The lands are hilly, very fertile, with an exuberant vegetation.

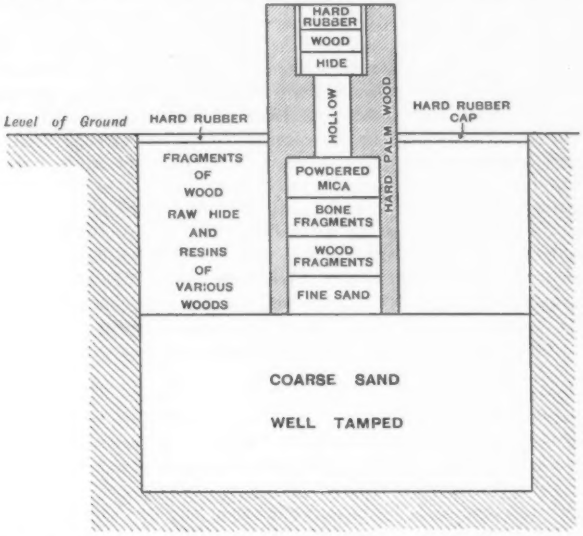
"I remained five days among these Indians. Their language is very similar to that of the Miranhas of Amazonas, and has a few words of the Therena of Western Matto Grosso. The following vocabulary will give an idea of it:—

Vocabulary.

What tribe do you belong to?	Guabila-guateli-téna?
We belong to this	Amago-hé-pÿ.
No; I don't want it; I am not agreed ...	Acó.
I want it; I accept...	Honaytÿ.
The head	Tacasú.
The hair	Anahé.
The eyes	Cesá.
The nose	Tinoâ.
The mouth	Agahó.
The teeth	Canha.
The neck	Yayoruá.
The breast	Putia.
The shoulders	Copey.
The arm	Yanó.
The stomach	Maricau.
The eyebrows	Namÿ.
The legs	Getemaupú.
The feet	Pihú.
The hands	Punÿ.
The house, or *malocca*	Ocausú.
The white man, or Christian	Carynosú.
A large boat	Moracatÿ.
A net or hammock	Ouÿsauarusú.
Arrows	Uhÿnasú.
Bow	Uhÿnarasúcó.
Poison for arrows	Orarÿ (not corarÿ).
An earthen pot	Comatÿnú.
Copal gum	Ananÿ.
Water	Uhehÿ.

"It appears that these Indians, many years ago, were heard of elsewhere under the name of Catuquina, but their true name is Catuquinarú. They resemble the Miranhas in many respects—in types, customs, and use of arms. The group which I found numbered 196, the greater part being women. They were divided into four sections, about a mile distant one from the other. I noted that their *maloccas* (habitations) were of recent construction, dating, perhaps, a few months back, which indicated that they led either a nomadic life or had been expelled from their previous home by other Indians or by white men. The *maloccas* were all located on the same straight line, north and south. The chief of the Catuquinarú is called the Tuchau; his name is Cumaytaté. He always treated me with a certain disconfidence, as is customary among the Indians, even in contact with their friends. I had to be very persistent to acquire a slight friendship with him, as a guarantee against the other members of the tribe, offering him strong drinks and presenting him with objects of different colours, especially red and blue, which pleased him best. All this I did with a view to learn something of the extraordinary telegraphic apparatus, called the cambarysú, which these Indians use, and one of

which they have hidden in each *malocca* occupied by the tribe. I made every effort to procure and take with me at least one of these wonderful instruments, but



CAMBARYSÚ OR TELEGRAPH OF THE CATUQUINARÚ INDIANS. CROSS-SECTION.
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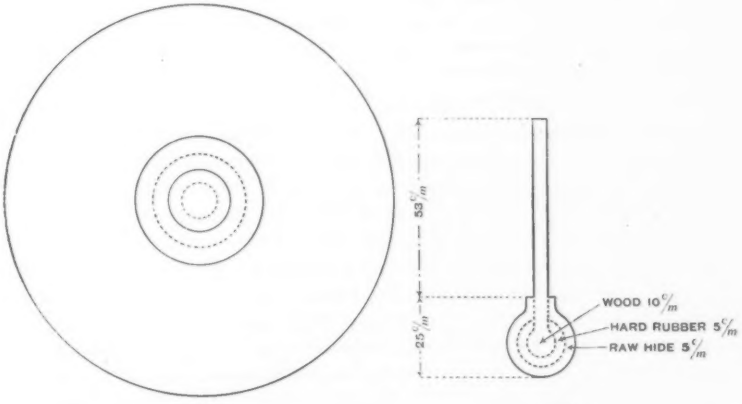


PLAN. CLUB.

could only get the promise of one if, on my return, I would give arms and ammunition in exchange.

"With much difficulty, I persuaded the Tuchau to let me see one of them. He dismounted the whole mysterious machine with great care. I examined it very

minutely, taking measurements of all its parts, and noting the materials of which it is composed.

"As previously stated, there is one of these instruments hidden in each *malocca*, and the *maloccas* are about a mile distant one from the other, and all on a direct line north and south. It appears that the instruments are *en rapport* with each other; and, when struck with a club, the neighbouring ones to the north and south, if not above a mile distant, respond to or echo the blow. To this an Indian answers by striking the instrument in the *malocca* with which it is desired to communicate, which blow in turn is echoed by the instrument originally struck. Each *malocca* has its own series of signals. So enclosed is each instrument in the *malocca* that, when standing outside and near the building, it is difficult to hear a blow, but, nevertheless, is heard distinctly in the next *malocca*, a mile distant, in the manner indicated. The Tuchau gave me an example of signalling. With a prolonged interval, he struck the instrument twice with the club, which, as I understood, was to indicate attention, or that a conference was desired. This was responded to by the same instrument, as a result of a single blow given by some one on the next apparatus, nearly a mile distant. Then commenced a long conversation, which I could not comprehend. The only thing I gathered was from the mimicry of the Indians, indicating that there were no sinister intentions.

"Before the Tuchau, Cumaytaté, left his own *malocca* to accompany me, he turned over the command to his eldest son, named Cumaytaté-hy. On arriving at the next *malocca*, we met the Tuchau-hy, Bacarutú by name, who gave me a pleasant reception. At the following *malocca*, we found the Tuchau, Lehyotú, who received us very coldly, which caused me to note that he was much disgusted. After looking at the telegraphic instrument, I commenced a conversation with the Indians, who answered that 'they belonged to Lehyotú,' and said, after a long conversation between the chiefs, that they 'were *formerly* Catuquinarús.' This phenomenon of the segmentation of tribes in this manner, I have also observed among the Botacudos and the Chamacocos.

"We then went on to the last *malocca*, where we were kindly received by the Tuchau-hy (Mahahyotú by name), and where we also found a telegraphic apparatus, the same as in the other *maloccas*."

I have had several conversations with Dr. Bach regarding this wonderful telegraphic system of a barbaric tribe. I can only account for its clear and distinct transmission of sound by supposing that there is in the locality some stratum of earth or rock of such composition that it easily transmits the vibrations of the blow given upon one of the instruments, which, being enclosed and nearly buried in the earth, certainly does not transmit the sound through the air. I have for years thought that the telephone of the future must be two unconnected instruments, so thoroughly *en rapport* with each other that, even if separated by the Atlantic ocean, a word spoken into one would be echoed by the other; but here, in the invention described, we have some semi-savage treading close upon the heels of the highest civilization.

Owing to the newness of their habitations, Dr. Bach appears to believe that these Indians are nomads. This may be true, but within a certain limited area. The Amazon tribes, in general, remain in, and try to control for themselves and their descendants, a river valley or a section of a valley of considerable length, and, when they have nearly

exhausted the game and fish of a certain locality, move to another, which for a time has been at rest. This is probably true of the Catuquinarús, who were formerly, as Dr. Bach says, known as the Cataquinas.

Castelnau, however, in 1855, fixed the habitat of one part of this tribe where Dr. Bach found it—lat. 10° 20′ S., and long. 72° W. from Paris; but another part of it in lat. 5° S., and long. 69° 30′ W.—the former fraction at the headwaters of the Juruá, and the latter about 350 miles north-east, not far above the mouth of the Juruá.

It is notable that some tribes in South America are found in fragments widely separated from each other; and, at times, an entire tribe has moved its habitat from 500 to 1000 miles from its original home, more especially since the time of the Spanish and Portuguese conquest. Such changes during the last four centuries may have been largely due to the pressure put upon the several tribes as their conquerors penetrated inland, the Indians seeking to escape from the exactions and cruelty of merciless task-masters.

Dr. Bach gives us a notable example of the way the segmentation of a tribe sometimes takes place, and how the part which splits off assumes a new name, although claiming parentage with the original family. In the case mentioned, he says that the fragment held that they "were *formerly* Catuquinarús," but that they "now belonged to Lehyotú." It is important also to note that when the chief, Cumaytate, left his *malocca* to accompany Dr. Bach, only 3 or 4 miles, he turned over his command to his eldest son, Cumaytate-hy, *hy* being a kind of diminutive, indicating the next in rank or subordinate. This act shows how ceaselessly the Indian is on the alert, and Dr. Bach also noted that all their senses were keenly sharpened. But this I have found true of all the Indian tribes I have travelled among—their senses and instincts have been so developed by evolution that, in certain directions, they are superior to the most civilized white man, the latter having retrograded in many of the best qualities possessed by his savage ancestor.

I once met a horde of Yocaré savages among the falls of the Madeira branch of the Amazon river. The chief, a young fellow perhaps twenty-five years old, appeared to know everything that was going on around him. He seemed to have eyes in the back of his head, so acute were his senses. His hearing appeared to indicate, and his mind to define, the thousand things which were occurring in the tropical forest around us. Instinctively, he classified and estimated them at their true value as if they were under close and accurate analysis. As he sat dining with me at my camp table, in the simplicity of his nature and modesty of his nakedness, I could not help thinking that, in the evolution of man, many magnificent qualities have been sacrificed upon the altar of civilization.

SIR ARCHIBALD GEIKIE ON SCENERY AND LITERATURE.

THE Romanes Lecture for 1898 was delivered at the Sheldonian Theatre, Oxford, by Sir Archibald Geikie, who selected as his subject "Types of Scenery and their Influence on Literature."* He limited the scope of his lecture strictly to the scenery of Great Britain, and almost entirely to British poets of past generations as affected by their familiar surroundings. He defined scenery as "those variations in the general aspect of the land that arise from the combined effects of three main geographical elements—topography, climate, and vegetation." With this definition in mind, the scenery of Great Britain is referable to the three great types of lowlands, uplands, and highlands, in each of which many individual varieties and shades of difference may be distinguished. Each type is considered with respect to the influence it has exercised on English literature in the past.

The lowlands of South-Eastern England are characterized by the gentle gradations of their surface forms, their generally favourable climate, fertile soil, and rich park-like vegetation. The streams flow softly along wide, flat valleys, and there is nothing bare or rugged to meet the eye. The placid peacefulness of these plains in their native alternation of woodland and meadow, or their more varied forms of cultivation, are reflected in verse as far back as Chaucer, Shakespeare, and Milton. To these great names Sir Archibald might, perhaps, have added Spenser, whose genius was so largely topographical. But in the multitude of illustrative examples of the influence of lowland scenery, he was constrained to limit himself to three—Cowper, Thomson, and Burns. Cowper was profoundly affected by the quiet, soothing beauty of the typically English valley of the Ouse; Thomson, at first dominated by the more restricted hill-girdled lowlands of Roxburghshire, which inspired his "Winter," fell completely under the spell of the softer, richer landscapes of the Thames valley in his "Castle of Indolence." Burns glorified in his verse his native plains of Ayrshire; curiously indifferent to the sea, even to the unrivalled beauty of the peaks of Arran rising across the Firth, he drew his inspiration from the moorlands and, above all, the river-valleys. He sang—

> "... auld Coila's plains an' fells,
> Her moors red-brown wi' heather-bells,
> Her banks and braes, her dens an' dells."

The uplands of the country were potent in the inspiration of the grand rough old border ballads, so crowded with feats of daring, and the romance of a wild, lawless life, that the natural features of the

* The Romanes Lecture, 1898: 'Types of Scenery and their Influence on Literature,' by Sir Archibald Geikie, D.C.L., F.R.S. Delivered in the Sheldonian Theatre, June 1, 1898. London: Macmillan & Co., Limited. 1898.

background are only commemorated in stray lines and phrases. The border ballads are poems of the dales or river-valleys, in which the various communities were isolated from one another, until they climbed their mountain barriers, or forded the river that barred their glen in front. The peculiar melancholy attached to the valley of the Yarrow, revealed in its full pathos by Scott and Wordsworth, is attributed by Sir Archibald Geikie to the character of the valley itself—the stream meandering along a narrow strip of green, smooth green slopes rising to rounded fells, mottled with bracken and heather, walling off the outer world; and only the murmur of the river on its shingle bars, and the cry of the curlew and plover, to greet the ear.

The Highlands, rugged in their scenery, raw in climate, rough and bare in their scanty vegetation, are most typically represented in Scotland, although Wales and the English Lake District share all these characteristics in less degree. The genius of Celtic poetry abides in these recesses, and the lecturer selects the Ossianic poems as its expression. While disclaiming any wish to enter into the controversy as to Macpherson's share in these poems, he introduces a shrewd method of criticism which seems to prove that in essence the poems are the genuine outcome of the Western Highlands. Macpherson was brought up in the inland region of Badenoch; the poems are saturated with the scenery of Western Argyll. "The grandeur and gloom of the Highland mountains, the spectral mists that sweep round the crags, the roar of the torrents, the gleams of sunlight on moor and lake, the wail of the breeze among the cairns of the dead, the unspeakable sadness that seems to brood over the landscape whether the sky be clear or clouded —these features of West Highland scenery were first revealed by Macpherson to the modern world." While Scott by his poems and novels turned the flood of touristdom into the Highlands, it is pointed out that his descriptions are those of a stranger attracted to the country and captivated by it, but not imbued with its inner spirit.

The poets of the Lake District are discussed mainly in the person of Wordsworth, whose wonderful insight is referred to, although the marvellous directness and simplicity of the topographical descriptions in his prose writings are not mentioned.

Sir Archibald Geikie truly observes that to treat his great and suggestive subject as it demands to be treated would require not one but a series of lectures; but he has succeeded in giving it an introduction that cannot fail to throw open to many geographical students a new door to regions of far-reaching interest. Modern fiction has derived much of its strength from geographical description; the works of Louis Stevenson, for instance, are more appropriately illustrated by maps than by pictures, and those of Mr. Neil Monro give in modern terms the same first-hand rendering of West Highland nature as appears in the Ossianic poems. There is room for a very profitable extension

of the Romanes lecture, and a sequel would be cordially welcomed by all geographers if the graceful and facile pen of the Director of the Geological Survey could but find time to produce it.

ADMIRALTY SURVEYS DURING THE YEAR 1897.

UNDER the orders of the Lords Commissioners of the Admiralty, eight of her Majesty's vessels with three small hired steam-vessels, manned by 75 officers and 756 men, have been employed on hydrographical surveys on the home and foreign stations. A naval officer, assisted by officers of the Royal India Marine, has also been employed, with the sanction of the Admiralty, under the Indian Government.

The following is a brief summary of the work performed, as detailed in the report prepared for presentation to Parliament.

The number of newly discovered rocks reported show no signs of diminishing, as reports of no less than 190 rocks and shoals, which are dangers to navigation, have been received in the Hydrographic Department, and notified to the public by notices to mariners.

A close examination was made of the entrance to Poole harbour, which showed that the banks on the east side of the channel had undergone considerable alteration; but there was no great difference in the direction or depth of the channel itself.

At Dungeness an examination was made with a view of ascertaining if any alteration had occurred during the last thirty years in the shape of the coast or depths immediately off the point. This examination proved that the high-water line had extended to the east and north-east, but had been cut away to the south and south-west of the point. The position of an alleged shoal north-east of Dungeness was also examined without shoal-water being discovered.

On the coast of Scotland a survey of the Firth of Forth was taken in hand and completed, a sketch-survey of the altered coast-line at Bo'ness was made, and the triangulation of the River Forth between Port Edgar and Alloa was commenced.

On the east coast the following surveys were carried out:—A large scale plan of the portion of the Medway situated outside the lock gates, Chatham Dockyard, was made; a re-survey of the south shore of the River Thames off Blythe sand was completed, the Duke of Edinburgh channel was re-surveyed, the correct position of the North Hinder Lightship ascertained, and the Yorkshire coast from Redcar to the eastward was commenced.

Owing to reports made by the Trinity House, Middle Cross Sand, off Yarmouth, was re-surveyed; the completion of this work showed that very great changes had taken place in the depths in the vicinity. A small portion of the River Orwell was also re-surveyed.

A new survey of Lough Carlingford was made; many shoals not previously charted being found. In the Scilly Isles a survey of Crow, Broad, and St. Mary's sounds was commenced on a large scale.

An area off Great Orme's head that had not been completed the previous season was sounded out, resulting in finding a rock with a least depth of 29 feet water, distant 5¼ cables from the headland.

At Portsmouth a re-survey was made of a portion of the harbour and the inner bar. Observations with a current meter were obtained during spring tides to ascertain the velocity of the tide at various depths in the entrance of Portsmouth harbour; the observations were considered to show that the velocity was uniform from the surface to the bottom.

On foreign and colonial shores—on the west coast of Newfoundland the survey of the coast was continued to the north from Daniel's cove, at which point it had been discontinued the previous season, and carried out to Point Rich. The localities of some doubtful soundings in St. John's Bay were examined, resulting in the discovery of a 5½-fathom rock; and two shoals to the northward of Ferolle were correctly charted. The south portion of White bay was also commenced.

In the Atlantic, deep-sea soundings were obtained at certain selected positions and observations made at two positions with a current meter to ascertain the depths and velocity of the equatorial current. The results were somewhat startling, as it appeared that below a depth of 10 fathoms the water was practically still, though running to the westward at a rate of 0·8 knots at the surface; but this result requires confirmation.

On the east coast of South America a running survey was made between the lighthouses of Capes Mogotes and Medano; a line of soundings was also carried over the Abrolhos bank.

In the Magellan strait, a running survey was carried through the Messier channel from Hale cove.

On the west coast of Boca Chica, the channel by which all vessels pass into Aranco bay on their up and down the coast, was examined in consequence of the reported presence of several dangerous rocks. "Hall" rock was correctly charted, and the existence of the "Cockatrice" and "Meteor" rocks disproved. Coronel bay was also re-sounded. Totoralillo bay and the ports of Huasco, Chañaral de las Animas, and Iquique were surveyed. Deep soundings were also obtained outside the very great depths of over 4000 fathoms obtained by the Central and South American Telegraph Company's cable steamer *Relay* in 1890, at a distance of 40 miles from the coast, between the latitudes of Huasco and Chañaral. These soundings showed that the great depression is a narrow trough running parallel to the coast and the chain of the Andes.

Ferrol and Coisco bay, with the soundings off the coast near them, from Mount Division to Santa head, was completed.

Various positions in the Strait of Magellan and west coast of South America were also determined, and magnetic observations were taken at Santa Catharina, Monte Video, Sandy point, Gray harbour, Huasco, and Callas.

In the Red sea unsuccessful searches were made for the reported King Arthur and Akbar shoals at the northern entrance of the Massawa channel; a further examination of the Gannet bank in the same locality was also made.

At Mauritius, a detailed survey of Grand port on a large scale was made, also surveys of Tombeau, Arsenal, and Black River bays.

Soundings were obtained between Mauritius and Coetivy island, also over the Seychelles bank; and a partial examination was made of the soundings to the west of Coetivy island, defining the bank surrounding the island.

In the West Indies a search was made for the Cuidado reef, between Mariguana and Little Inagua, but without success; also for Clarion shoal, said to be situated 15 miles south-west of the south-west end of Great Inagua; the search for this shoal resulted in obtaining a least depth of 234 fathoms; the position of this sounding is now shown as Clarion bank on the chart.

At Jamaica an examination was made of the ship channel between Port Royal and Kingston, proving that there is no practical difference from the original survey.

A search in the neighbourhood of Serranilla bank resulted in the verification of the report of a new reef 10 miles in diameter, and circular in form, the least water being 6½ fathoms on the north-east side, with a general depth of 15 fathoms

elsewhere. It is remarkable that an extensive bank of this description has escaped detection so long.

A survey of Belize, which had been commenced the previous year, was completed; very great differences from the depths shown on the charts being found.

On the east coast of North America, a triangulation of the Strait of Belle Isle was undertaken; 32 miles off the coast of Labrador side was also mapped and plans made of Pinware and Black bays, and Anse à Loup. A meridian distance was also obtained between Bonne bay, Newfoundland, and Forteau bay. At Bermuda an examination of the localities where recent dredging operations had been carried out was made.

In the Pacific one of the surveying vessels made an extensive cruise to Honolulu, *viâ* Palmyra and Fanning islands, to search for reported shoals, survey islands, and obtain soundings at the same time, which would be useful for a Pacific cable. Lines of soundings were carried from Sydney to Fiji, Fiji to Sydney island, to Palmyra island, and northward to a position about 150 miles southward of the Sandwich islands. Also from a position about 360 miles south-east of the Sandwich islands to Fanning island and Suva. Between Suva and Auckland a meridian distance was carried, also a line of soundings run to the eastward of former lines *en route*. From Auckland soundings were taken to North cape and thence to Hobart.

During this cruise, Palmyra island and anchorage was surveyed; Fanning island was surveyed, the soundings being carried out to a sufficient distance to delineate the 1000 fathoms' contour line, also plans made on large scales of English harbour and Whaler anchorage. Ringman reef and Tavuini bank were examined; Caldew reef, Maria and Diana shoals were searched for unsuccessfully. From Fiji a line of soundings was run through the Nanuka passage, and thence to the reported positions of the various banks lying near the parallel of 12° S., and extending over several degrees of longitude. Of those searched for, the Lalla Rookh, Robbie, Adolph, Turpin, and an unnamed shoal was found, as well as two more banks, which received the names of Home and Tuscarora. These banks rise from a general depth of 2500 fathoms, and are of the usual coral formation, some of considerable size, varying between 3 and 20 miles across. The larger ones show the submerged atoll form, the smaller are flat, varying from 9 to 20 fathoms over them. The general depths of the former are from 25 to 27 fathoms, with a shoaler rim. No danger was found on any of them.

On the coast of South Australia, Esperance bay was surveyed, also the approaches. This bay is the nearest point on the coast-line to the West Australian goldfields, and the town is increasing rapidly.

On the Queensland coast the survey was resumed inside the barrier reef, northward of Cooktown, and a good passage examined through the Barrier between Stapleton island and No. 1 sand bank. A line of deep-sea soundings was also obtained outside the barrier reef from Cook passage to Grafton passage, where no information existed before as to the depths. A triangulation from Night island, south to Cliff island, a distance of 70 miles, was completed, and the survey of the inner route proceeded with.

The coast from Wedge bay to Port Arthur, in Tasmania, which was commenced the previous season, was completed, the soundings being carried out 12 miles off the coast.

In India, the positions of the Krishna shoal and Baragua light vessels, off the Irrawaddy, were accurately determined, and an unsuccessful search made for the "Vita" shoal, reported by the s.s. *Vita* to be 9 miles south-west of the Krishna shoal higher up.

The work of resounding the gulf of Martabau was commenced; the depths were found to be considerably different from what was shown on the chart, thus confirming the report forwarded from time to time by vessels frequenting the gulf.

In the Andaman, the surveys of the Cleugh passage and the Coco channel were proceeded with. Large-scale plans were also made of Madras harbour and the entrance to the Bombay docks.

During the year the Hydrographic Department has published one hundred and thirty-two new charts and plans, and improved eighteen plates by the addition of twenty-six new plans; 280 plates have been largely improved by corrections and additions; 4390 corrections have been made to plates by the engraver; and 32,567 charts have received minor corrections at the hands of the draughtsmen.

The number of charts printed for the requirements of the Royal Navy, for government departments, and to meet the demand of the general public, has, during 1897, amounted to 365,657.

THE ANGLO-FRENCH BOUNDARIES IN WEST AFRICA.

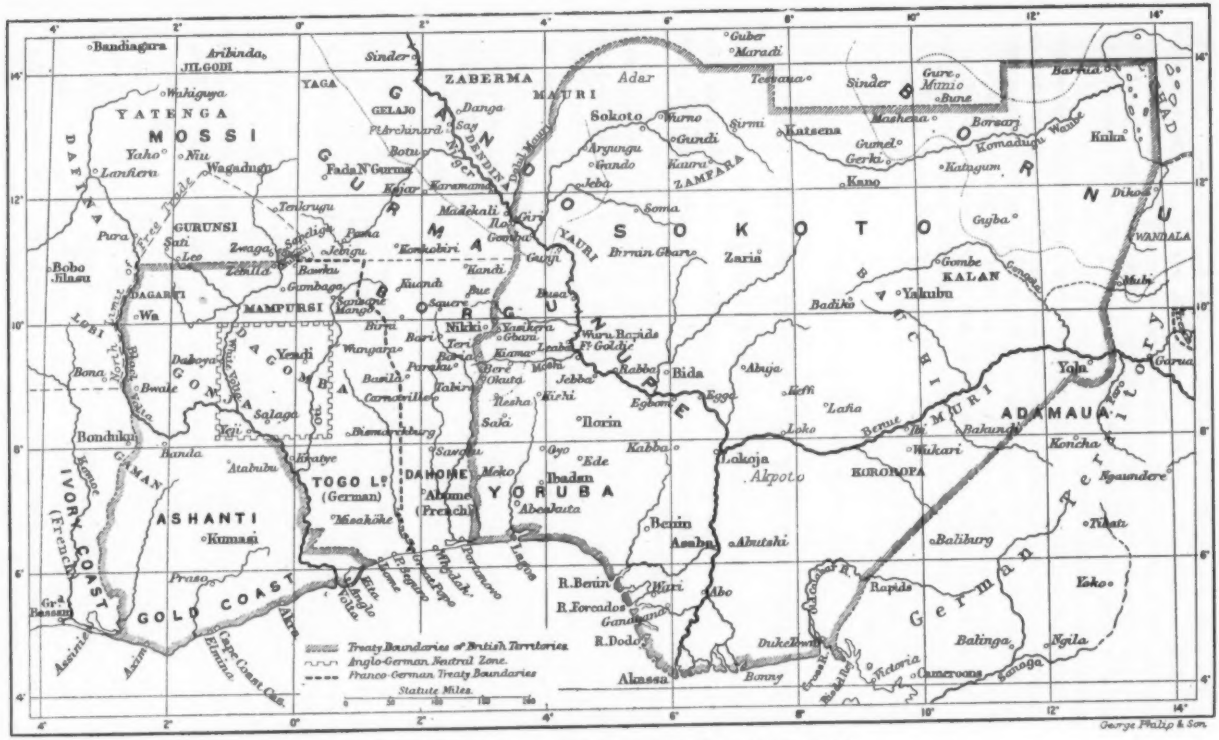
By E. G. RAVENSTEIN.

THE boundaries between the British and French possessions on the Guinea coast and within the Niger territories have been settled, after long negotiations, by an agreement signed on June 14 at Paris.

The western boundary of the Gold Coast Protectorate is now formed by the Black Volta as far as lat. 11° N. It then follows the 11th parallel in an easterly direction to one of the head-streams of the White Volta, and then diverges to the north, so as to place the village of Sapeliga within the British sphere. It then follows the river Nuhau to a point 2 miles eastward of the road leading from Gambaga, by way of Bawku, to Terkrugu. It finally rejoins the 11th parallel at the point where it is intersected by the road leading from Sansane Mango, by way of Jebigu, to Pama.

It appears from this that, while England retires from Bona to the east of the Volta, and surrenders all claim to Mossi, the French withdraw from Wa, where they, however, only arrived after that place had been occupied by a British force.

The western limit of Yoruba and the Niger territories, as far as lat. 9° N., is formed by the line agreed upon on October 12, 1896. Thence a line is drawn to the Niger, 10 miles (as the crow flies) above Giri, the port of Ilo. This line leaves the villages of Tabira, Okuto, Boria, Teri, Obani, Yasikera, and Dekala within the British sphere. From above Giri the boundary follows the midway of the Niger as far as the mouth of a dry watercourse, supposed to be the Dalul Mauri. It then follows this watercourse until it meets the circumference of a circle drawn from the centre of the town of Sokoto, with a radius of 100 miles. It follows the northern arc of this circle until it intersects the 14th parallel for the second time. It then follows the 14th parallel for 70 miles; then


Bandiagara
Aribinda
JILGODI
Sinder
Guber
Maradi
Wahigya
YATENGA
MOSSI
Yaho
Niu
Wagadugu
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YAGA
ZABERMA
MAURI
Adar
Tessaua
Sinder
Gure
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Kanem
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WANDALA
GELAJO
Danga
Ptarchard
Say
Botu
Fada N'Gurma
Karamamba
Sokoto
Yurno
Gundi
Sirmi
Katsena
Mashena
Gumel
Gerki
Katagum
Kano
Komadugu
Bornu
Gyiba
Gombe
KALAN
Yakuba
Badiko
Mubi
Gongola
Yola
Garua
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Ngaundere
Tibati
Baliburg
Yoko
Rapids
Batinga
Ngila
Cameroons
Victoria
Bonny
Duke Town
Akassa
Abutshi
Asaba
Benin
Akpoto
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Lokoja
Idah
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Ede
Ibadan
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DAHOME
Abome
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TOGO L.d
(German)
Misahöhe
Atakpame
Sansane
Mangu
Kabba
Okuta
Nesha
Basilà
Tabira
Carnarvilleo
Bismarckburg
Yendi
Wangara
Paraku
Bere
Kiama
Nikki
Yaskera
Gbara
Bussa
Kuandi
Kandi
Gambaga
Bawku
Zamga
Leo
Jebugu
Fada
Tenkrugu
Pura
Sati
Zabilla
Bobo Jilasso
DAGARTI
Wa
MAMPURSI
GURUNSI
Lobi
Bona
Bwale
Bondukú
Banda
Atabubu
Prasso
Gr. Bassam
ASHANTI
Kumasi
GOLD COAST
Accra
Cape Coast Cas.
Axim
Assini
IVORY COAST (French)
GERMAN
Mouhoun
Black Volta
White Volta
Red Volta
Oti
Daboya
Salaga
Kete
Akatsi
Ada
Aflao
Lagos
Porto Novo
Wuro Bapido
Ft Goldie
Zaria
Birnin Gbari
Kano
Maska
Kauru
Zamfara
Soma
Jeba
Gunji
Madekali
Gwaska
Kiama
Ilesha
Jebba
Egbom
Egga
Loko
Lafia
Nassarawa
Keffi
Abuja
Bakundi
Wukari
Akpoto
Rapids
Abo
Wiri
R. Benin
R. Forcados
R. Dodo
Gandagara
Yauri
Birnin Gbari
Zaria
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Porto Novo
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Ft Goldie
Zaria
Birnin Gbari
Kano
Maska
Kauru
Zamfara
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Gunji
Madekali
Gwaska
Kiama
Ilesha
Jebba

descends due south to lat. 13° 20′ N.; then eastward along this parallel for a distance of 250 miles; then regains the 14th parallel, and follows it as far as a meridian, passing 35′ east of Kuka; and ultimately this meridian southward, until its intersection with the southern shore of Lake Chad. As Kuka, according to Monteil, lies in 13° 25′ E., this meridian passes 14° E. of Greenwich, and coincides with the boundary laid down in the Anglo-German agreement of 1893 (see *Geographical Journal*, vol. iii. p. 43). France, moreover, expressly recognizes the boundary just referred to as binding her.

On looking at our map, it will be seen that France surrenders her stations of Busa, Gomba, and Ilo, on the Niger. England, on the other hand, not only surrenders Nikki, with the greater portion of Borgu, but also the greater part of Gando, which has always been looked upon as a vassal state of the empire of Sokoto. The northern boundary now assigned to the empire just named does not include the whole of the territories which are usually claimed for it, whilst Sinder and Munio (Gure), belonging to Bornu, have been surrendered to France.

By Article VIII., the British Government agrees to lease to France for thirty years two plots of land on the Niger; the one, on the right bank, between Leaba and the mouth of the Moshi; the other, at one of the mouths of the Niger. The river frontage of each of these plots shall not exceed 400 metres in length, nor the total area 50 hectares (123 acres). This lease conveys no territorial rights, and practically limits France to the erection of bonded warehouses upon the lands leased.

Article IX. defines an area within which British and French subjects and protected persons shall be treated on equal terms in all matters of trade and navigation. This territory includes the Ivory Coast, from Liberia as far as the Gold Coast Protectorate; the region to the eastward, as far as the new boundary of the Niger territories, to the south of lat. 11° N.; the whole of the British Niger territories; and, finally, a triangular district, the apex of which is Wagadugu, the capital of Mossi.

Our map is based upon the maps attached to the agreement. Most of the places mentioned during recent controversies have been inserted upon it.

SKETCH-MAP OF ANGLO-FRENCH BOUNDARIES IN WEST AFRICA.

THE MONTHLY RECORD.

THE SOCIETY.

Antarctic Exploration.—In October last, the President, on behalf of the Council, wrote at some length to the Prime Minister, urging upon Government the necessity for a renewal of antarctic exploration by this country, and pressing upon his lordship the duty of England to complete the work begun by Ross half a century ago. This letter was acknowledged in a way that inspired the Council with a hope that

Government would undertake the much-needed task. Unfortunately, a final reply has been received from Lord Salisbury, stating that he cannot hold out any hope of Her Majesty's Government "embarking upon an undertaking of this magnitude," and that, from a communication which has been received from the Australian Colonies, there is no prospect of any joint action in that quarter. As the Council are strongly impressed with the feeling that it is the duty of this country to undertake the exploration of the great unknown antarctic region, and not to leave it to other nations, they have authorized the President to take steps to obtain the necessary funds, not less than £50,000, towards which the Society will contribute £5000.

EUROPE.

The Vernagtferner.—The German and Austrian Alpine Club announces the beginning of a new series of scientific publications in the form of *Ergänzungshefte*, or supplementary numbers of the Club's *Zeitschrift*, similar to those published by *Petermann's Mitteilungen* and the *Geographical Journal*. An excellent start has been made with a monograph on the Vernagtferner (Vernagt glacier) by Dr. S. Finsterwalder, of Munich, and the immense activity with which research in all branches of physical geography is now being carried on both in Germany and Austria, affords good prospect that this paper will be followed by others of equally high merit. If we take the valleys of the Inn, the Oetz, the Passeier, and the Etsch as the bounding-lines of the Oetzthal Alps, we have a figure with the Vernagtferner placed almost exactly in its centre of gravity. The Weisskamm, the main ridge of the system, marked out by such summits as the Weisskugel, the Fluchtkogl, the Hochvernagtspitze, the Hinterer Brochkogl, the Wildspitze, and the Schwarze Schneide, has a general trend from south-west to north-east, but between the Fluchtkogl and the Hinterer Brochkogl it sweeps round in a curve concave southwards, and a kind of amphitheatre is completed by two minor ridges running south-east from the Fluchtkogl to the Vordere Guslarspitze, and south from the Hinterer Brochkogl to the Platteikogl. The oval basin thus enclosed has an area of about 7½ square miles; it drains to the Vernagtthal, and forms the snow-field of the glacier. It is divided unequally into two areas, one about three times the size of the other, by the rocky Hintergraslkamm; the larger is the Hochvernagtferner, the smaller the Guslarferner, and each has a small semi-independent bay, known as the Klein-Vernagtferner and the Klein-Guslarferner respectively. From the point of junction of the two main branches at the Hintergrasl, the Vernagtthal extends downwards for about a mile as a steep gorge, some 500 yards wide and 700 feet deep, with precipitous sides, and enters the Rofenthal almost at a right angle. The Vernagtferner thus appears as a perfectly definite system; the limits of its basin are clearly outlined, and the whole drainage must pass through a single narrow channel. Hence the conditions are favourable for exact measurements, which can be repeated from time to time in such a way as to allow of easy comparison with one another; and the extreme scientific, as well as practical, interest of such measurements, arises from the fact that whereas at certain periods the end of the glacier has been known to retreat to such an extent that the Hoch-Vernagtferner and the Guslarferner have become actually separate, at others it has advanced down the whole length of the Vernagtthal and crossed to the Zwerchwand opposite, completely blocking the Rofenthal, damming the Rofener Ache which flows through it, and forming a lake which may have been as much as 1200 yards

long, 300 yards broad, and 600 feet deep. The formation of such a lake naturally leads, sooner or later, to an outburst causing immense damage in the lower parts of the Rofenthal, in the Oetzthal, and even in the Innthal; such catastrophes occurred in the years 1600, 1680, 1770, and 1845. The brief description just given will suffice to show that Dr. Finsterwalder has undertaken a work well worth doing. His report is divided into three main parts. The first describes the general topography of the Vernagtferner, and summarizes the results of an exhaustive critical examination of the information extant about the movements of the glacier and its moraines in the past. The second consists of a detailed account of a minute special survey of the region made by Drs. Finsterwalder, Blümcke, Hess, and Kerschensteiner in 1889, and furnishes an excellent model of what such surveys should be, especially with regard to the application of photography, and to the methods of reduction of data; upon this is based a large-scale map. The third and longest section is devoted to analysis of the results of the two preceding, and applications to the general questions of glacier motion. It is impossible to give even the main drift of Dr. Finsterwalder's conclusions here, but it may be said that they derive special interest and value from the mode of discussion, which omits all assumptions involving friction, regelation, etc., and deals simply with the geometrical idea of stream-lines. An important appendix, with subsidiary maps, describes further partial surveys of the glacier made by Drs. Blümcke and Hess in 1891, 1893, and 1895, and compares the state of affairs at those dates with the main survey of 1889. In 1895 the extremities of the Hoch-Vernagtferner and the Guslarferner were entirely separated, having retreated to what must be nearly a minimum position, as the upper parts of the ice-streams had in the same time increased in height by about 30 feet. The final complete explanation of the extraordinary changes taking place in this glacier will probably not be forthcoming until the next maximum, which may be expected about a quarter of a century hence. We may wish Dr. Finsterwalder and his colleagues the happiness of being able to continue their watch upon its vagaries until their labours are thus crowned; meanwhile they hazard the suggestion that on account of peculiarities in the shape of the basin, parts of the "Firn"-area really lie dormant, and contribute nothing to the glacier ice, except under prolonged conditions of unusual severity, such as may occur during the "cold-periods" of Brückner. It must be admitted that the dates of the formation of a lake in the Rofenthal correspond temptingly with those of Brückner's minima, if we allow even a modest interval for cause to take effect.

AFRICA.

Journey in the Galla Countries South of Shoa.—An important journey has lately been made by a French traveller, M. Darragon, through some of the least known Galla countries south of Shoa. An account of it appears in the *Comptes Rendus* of the Paris Geographical Society (1898, No. 3). Entrusted by King Menelik with a mission to the Borana Gallas, M. Darragon proceeded south through Gurage, and reached the Borana country by a route to the east of the Lake Pagade, discovered by Captain Bòttego, thus for the first time connecting the itineraries of travellers from the north with those from the east through Southern Somaliland. His delineation of the chain of lakes, of which Pagade is the largest, differs considerably from that of previous travellers. South of Lake Ororosha, or Shahalla, which has hitherto appeared on our maps as the southernmost of the Zuai group, he places a small lake, Abbasi, north of Pagade. This may be the Lake Abbas first mentioned by D'Abbadie, but as the name, in one form or another, appears to be applied to any large body of water, any of the other lakes of this region may equally well have been the one referred to. East of Lake Abbasi M. Darragon

places a range of mountains running north and south, which he considers the continuation of a range found by him to run in the same direction east of Lake Pagade, in the Sidama country. These mountains seem to reach a considerable altitude, as M. Darragon places some of his camping-stations at heights of 9000 feet and more. In the Amara country, further south, the French traveller reached ground already traversed by Dr. Donaldson Smith. Both Sidama and Amara are fertile countries, covered in their upper parts by impenetrable forests. The inhabitants, Gallas, are now subject to Menelik. On reaching Sogida, in the Borana steppe, where not a drop of water was found for 50 miles, M. Darragon retraced his steps, crossing the Sagan, or Sageun, and returning through the countries west of Lake Pagade. In Konso the inhabitants were quite black, and were remarkable for their industry. They have lately been made subject to the Abyssinians. After passing through several mountainous districts, the traveller reached Walamo, which occupies an immense plain dominated by Mount Damota. The Omo was but a short distance to the west, but M. Darragon did not visit it, nor could he gather any information about it, but, from the direction of the mountains, it seemed to take a westerly course. The Wera, or Billati, apparently the Waira of our maps, flows, according to M. Darragon, into Lake Pagade, from which issues the Sagan, the feeder of Lake Stefanie. According to Bòttego's companions, however, the effluent of Lake Pagade enters the Lake Abbaja of Dr. Donaldson Smith, which lies to the south-west of Pagade.

Count Wickenberg's Journey in Somaliland.—On his return from a hunting and exploring trip to Somaliland, carried out in the latter half of 1897, Count Wickenburg handed over his notes and scientific observations to Prof. Paulitschke, who now contributes to *Petermanns Mitteilungen* (1898, No. 3) a short account of the journey, accompanied by a map on the scale of 1:1,000,000. Although Count Wickenburg's first idea of penetrating to Lake Rudolf (*Journal*, vol. x. p. 328) was abandoned, owing to the opposition of King Menelik, the Austrian traveller succeeded in filling up several blanks in the map of Northern Somaliland. Starting from Berbera on June 24, Count Wickenburg proceeded at first south-west to the valley of the Tug Der, explored in 1896–97 by Messrs. Parkinson, Brander-Dunbar, and Aylmer. Arrived at Bur Dap, an important trade-centre near the low hills of the same name, also explored by the British travellers, the count turned in a south-westerly direction across the district of the Dolbohanta Somalis, hitherto unvisited by white men, to Fafanjer in Ogaden. Bur Dap lies at the north-east edge of the waterless Haud plateau, the eastern part of which had to be crossed by this route. Much of the country was uninhabited and covered with thorny bush, but parts were open and well grassed. The Dolbahanta are the most independent of the tribes within the British protectorate, and they assumed an arrogant demeanour towards the travellers. The Arsama Ahmed, one of their sections, are rich in horses, and undertake raids on Ogaden for the purpose of stealing camels. Before reaching Fafanjer (where there is a series of pools which contain water most of the year) the caravan suffered severely from thirst. The watering-place is not now in British territory, and the Bachawadle of the neighbourhood have already been put under contribution by the Abyssinians. The route now led west, thick bush alternating with dry red sandy soil, and afterwards giving place to the open grassy plains of the Ber Harun. After exploring the Tug Jerer and two other branches of the Tug Faf, in a thickly populated district, Count Wickenburg proceeded south to Omen, and thence north-west through a mountainous and waterless region to the Sulul, which he explored for a considerable distance above its confluence with the Dakatto. Its bed, which contained no running water at the time, is deeply

eroded between banks 30 feet high, the adjacent plateau being covered with grass and bush, and supporting large herds of *Equus grevii*. Again reaching the Jerer, and ascending it for some distance, the Count crossed the Haud by a new route to Hargeisa, and continued his way thence to Berbera. The Abyssinians appear to have firmly established their sway over all the tribes along the Jerer visited by Count Wickenburg. Prof. Paulitschke records the meteorological observations made by the Austrian traveller, and discusses the data used in the construction of the map. Count Wickenburg has lately been engaged in scientific work near Mount Kilimanjaro.

Surveys in German East Africa.—The first number of the *Forschungen aus den Deutschen Schutzgebieten* for the present year contains a map by Dr. R. Kiepert and Max Moisel, which helps to fill in one of the most important blanks hitherto existing in the map of German East Africa. The region in question is that lying south-west of Ugogo, and north-east of Lake Rukwa, about which little has been known, with the exception of some vague information collected by Burton in 1858. It was traversed in part in 1895 by Captain Prince, who, starting from Kilimatinde, in Ugogo, made a wide circuit to the south-west, reaching as his furthest point west a place called Kwikuru-kwa-Mtsavira, in the district of Kiwere. In 1896–97, Lieut. Stadlbaur surveyed a route through the district of Itumba, lying chiefly to the south-east of Prince's route, and it is on the work of these two travellers, supplemented in part by information supplied by Lieut. Kielmayer in 1897, that Dr. Kiepert's map is based. The whole of the region, between 5° 30′ and 8° S., is inhabited principally by the Wakimbu, the chief district being that of Itumba, which embraces a considerable area under the suzerainty of the chief Guluwala. South of Itumba lies the independent district of Iringa, inhabited by Wakimbu and Wagogo. Dr. Kiepert considers it doubtful whether or not the Wakimbu countries should be included under the general name Unyamwezi, which, moreover, is not used by the people themselves, the country so-called consisting of a number of independent districts. According to the map, the Wakimbu country is drained chiefly towards the Rufiji, though Kiwere is traversed by a stream flowing towards Lake Rukwa.

French Expeditions to Lake Chad.—News has been received in Paris from M. Gentil, leader of the expedition sent out three years ago for the purpose of placing a steamer on the Shari and Lake Chad, announcing his successful descent of that river and arrival at the open water of the lake. Before proceeding thither, M. Gentil ascended the Bahr Erguieg in the *Leon Blot* to within 10 miles of Massinia, the capital of Baghirmi, where he met with a cordial reception from the Sultan. Although Rabah had established several garrisons on the lower Shari, he had not completed the subjection of Baghirmi, where the population is eager to take vengeance on the adventurer for the cruelties committed by him. The fortified posts on the Shari might have proved dangerous obstacles in the way of an advance to the lake, but the garrisons fled on hearing of the arrival of "Crampel's brothers," Rabah having been, it is said, the instigator of the murder of that traveller. Gulfei, one of these posts, on the left bank of one of the branches of the Shari, has walls forming a square of nearly 3 miles, with two projecting forts. Its population is about 10,000. The open water of Lake Chad was reached on November 1, and it presented the appearance of a veritable sea. A number of islands block the entrance of the river, and nothing is to be seen but grass, reeds, and papyrus. No firewood is to be obtained on the shores of the lake, but there is abundance on the banks of the lower Shari. Scarcity of supplies prevented the complete exploration of the lake, and M. Gentil returned to Baghirmi and the Gribingi, whence the letter lately received was written. As the geographical results of the expedition,

M. Gentil mentions the survey of the course of the Gribingi and Shari; the discovery of the mouths of the Ba N'Goru, of the Bakari, and of a river which connects with the Bahr Salamat; the examination of the Bahr Erguieg as far as a place called Maggi; and the quasi-demonstration that the Logone is only a branch of the Shari. The Gribingi is only a tributary, and not one of the main branches, having a breadth of little over 70 yards at the confluence, whereas the Shari is three times as wide and much deeper. M. Gentil has since returned to the coast.

Dr. Hans Meyer's New Expedition to Mount Kilimanjaro.—*Globus* (vol. 73, No. 21) announces that Dr. Hans Meyer has undertaken a third expedition to Mount Kilimanjaro, and that he was to start in June, accompanied by an artist, Herr Platz. He hopes to fill in some of the gaps which, in spite of his own work and that of other travellers, still exist in our knowledge of the mountain, especially with regard to its northern slopes. Among the points to be studied are those of the former glaciation of the mountain, the distribution of Alpine plants, the features of the Mawenzi crater, etc. The expedition is expected to last six months.

French Scientific "Protection" in Madagascar. — The *Politique Coloniale* of May 25, 1898, publishes a circular addressed by General Gallieni, the French governor of Madagascar, to the local officials of the island, in which he states that past explorations have demonstrated the existence of fossils of great scientific value in the soil of the island, and that the unexplored regions may be expected to yield equally interesting results. The general goes on to say that he thinks it a matter of national interest to reserve to his countrymen the benefits of extracting fossils in the future, too many having already passed into the possession of foreigners; and he states that no fossil-collectors will be tolerated unless provided with a special licence from the governor-general. He concludes by enjoining on the various provincial officials the importance of informing the natives of the new prohibition. This order occasions the more surprise on account of the fact that the Government of France is famous for the encouragement it gives to French scholars and men of science to carry out archæological and scientific surveys, and make collections in other countries. It would be a loss to science, and particularly to geography, if French explorers were henceforth to be prohibited from straying beyond the territories administered by the Republic, yet this is the logical outcome of the policy now inaugurated in Madagascar, a policy which other governments may adopt in an imitative, if not in a retaliatory, spirit.

AUSTRALASIA AND OCEANIC ISLANDS.

Geographical Distribution of Vertebrates in Victoria.—A paper by Mr. A. H. S. Lucas, on "Some Facts in the Geographical Distribution of Land and Fresh-water Vertebrates in Victoria," appears in the latest volume (vol. ix., New Series) of the *Proceedings* of the Royal Society of Victoria. The subject is mainly dealt with in a series of tables, in which, for purposes of comparison, the distribution of Tasmanian forms is included as far as known. From the zoological facts, some definite conclusions may be formed as to the relative age of the two barriers—the Bass straits and the Dividing range. As is pointed out, Bass straits in its present condition must have presented a very formidable barrier to the passage of all land and fresh water vertebrates unfurnished with wings; while the Dividing range has been felt in its action on the rainfall, two widely divergent climatic conditions having thus been produced—a humid region in the south-east, and a dry region in the north-west; hence, two faunas suited to the two regions. The marked distinctness, frequently extending to the genera, of the faunas of the

north-west plains and the well-watered south-east hill and coast country, points to the long persistence and ancient origin of the Dividing range. So, going on the zoological evidence only, it seems clear that the Bass straits were formed sufficiently to serve as an effective barrier before the dingo and the most highly differentiated tree-forms reached Southern Victoria, and after the forests had been established and the streams stocked with the existing fish, long after the separation or evolution of the two Victorian faunas had taken place. During the process of widening and deepening of the straits, the dingo invaded Victoria, the thylacine and Tasmanian devil disappeared, while the koala and flying opossums came in from the north along the eastern strip of Australia, and made their habitat in the Gippsland forests along with the fruit-eating bats, and, speaking generally, the present distribution of vertebrates in Victoria has been effected.

The Ramu Expedition, German New Guinea.—It is announced in *Globus* (vol. 73, No. 21) that the expedition sent out under Lieut. Tappenbeck to explore the Ottilien river with a steamer, and complete the work of the former expedition under Dr. Lauterbach, has been successful in proving the identity of the Ramu, discovered in the interior by the latter, with the Ottilien, which enters the sea a little to the east of the mouth of the Kaiserin Augusta. The stream was ascended for a distance of 125 miles, and an important waterway leading into the centre of the German territory has thus been discovered.

Publication of Baron von Schleinitz's Survey of the Coast of New Pomerania.—The *Zeitschrift* of the Berlin Geographical Society (1897, No. 6) contains a paper by Baron von Schleinitz, accompanied by a map on the scale of 1 : 500,000, on the results of the surveys of the coasts of New Pomerania (formerly New Britain) carried out by him in 1887. Although the general results were made known at the time, no full account seems previously to have been published. The most important discovery made by the German admiral was that the land lying northward of the central part of the north coast, instead of forming islands as was thought by D'Entrecasteaux during his voyage of 1793, and as had been shown on all maps since that date, really formed a much indented volcanic peninsula. Some doubt seems to have existed as to the correctness of von Schleinitz's statement, for some recent maps (*e.g.* Kiepert's Deutsche Kolonial Atlas) have still shown the land in question as consisting of islands. In his lately published map, von Schleinitz carefully distinguishes between the coastline actually seen by himself and that derived from other surveys, and though the whole of the coast of the peninsula was not followed, there seems little room for doubt that he is correct in his statement. The shores of the whole eastern half of New Pomerania are carefully described in the paper, special attention being paid to the position of dangers to navigation, and useful information is given as to the surface features visible from the coast. A considerable stream appeared to debouch on the north coast a little east of 151° E., while the plain to the east of it, sloping up to the group of volcanic peaks clustering round the "Father," seemed a promising field for plantations. In his map the writer has introduced the correction in the delineation of the coast-line shown to be necessary by recent astronomical observations at Matupi island, in Blanche bay.

Visits to the Shortland Islands, Solomon Group, and the Coast of German New Guinea.—The issue for 1897 of *Nachrichten über Kaiser Wilhelms-Land*, etc., contains a short account of a visit to the Shortland islands, lying off the south end of Bougainville, in the German portion of the Solomon group, made by Dr. Hahl during his cruises with the government police force. The islands are all of volcanic origin, and have, as a rule, a small elevation in the centre. There

is an excellent harbour at Faisi. All the land is covered with dense forest, species of hard woods being apparently abundant. The soil beneath the surface layer of humus consists of yellow clay with grey sand beneath. The population, which is fast decreasing, does not appear to exceed nine hundred, the main island being quite uninhabited, though used for plantations. The chiefs have submitted to the German Government. Dr. Hahl afterwards visited the east coast of New Pomerania, where the inhabitants were very shy, and also the south-east coast of German New Guinea, near the British frontier. At Traitor bay some miners were found, who had penetrated as far as Mount Scratchley, but without obtaining much gold. The inner part of the bay, the only portion of use as an anchorage or landing-place, falls within the British sphere, while the Ikore river, which is in German territory, cannot compete with the Mambare as a route to the interior. A good view was obtained of the interior mountains, the western portion of which extends into the German sphere.

POLAR REGIONS.

Captain Sverdrup's Expedition.—Some further details respecting Captain Sverdrup's forthcoming expedition to the north of Greenland have lately been published by the *Times*. The *Fram* has been partially rebuilt and refitted for the purposes of the expedition, a sum of money sufficient to cover the cost of the alterations having been placed at Captain Sverdrup's disposal by the Norwegian Government, whose property the ship is. For illumination and cooking purposes twenty tons of petroleum are being taken, thus reducing considerably the amount of coal required. Stores for sixteen men for about four years have been provided, whilst a depôt of coal, together with relays of dogs, has already been got ready at Godhavn and other places in Greenland. It is hoped that Robeson channel may be reached by August, the month in which it will be most free from ice. Winter quarters will be sought on the north-west coast of Greenland, and the various members of the expedition will study the different forms of arctic life and phenomena, and explore the surrounding country by means of sledge-journeys. The staff will include the following: astronomer, Lieut. Victor Baumann; cartographer, Lieut. Ysachsen; meteorologist, Dr. Svendsen; zoologist, Dr. E. Bay; botanist, Dr. H. S. Simmonds; geologist, Dr. P. Schei. The expenses of the equipment, etc., are being paid by Consul Axel Heiberg and MM. Arnund and Ellef Ringnes.

Mr. Wellman's Polar Expedition.—Mr. Wellman's plans for a new expedition to the polar regions have now taken definite shape, and have received the approval of the National Geographic Society of Washington and of the United States Coast and Geodetic Survey and Weather Bureau. The scientific staff will include officers of both these government departments, viz. Mr. Q. Harlan, who goes as physicist, and Mr. E. B. Walker, meteorologist and geologist. The latter accompanied Peary to Greenland. Dr. E. Hoffma will accompany the expedition as medical officer and naturalist; while Prof. J. H. Gore will go as far as Franz Josef Land, for the purpose of making pendulum observations. A charter of the Norwegian steam-whaler *Fridtjof*, said to be the strongest ice-steamer in Norway, has been obtained, and Mr. Wellman hoped to start from Tromsö about the end of June. Experienced Norwegian ice-pilots have been engaged, including Paul Bjorvig, who accompanied Mr. Wellman to Spitsbergen in 1894, and also went with the Andrée search-party to the same country last autumn. Bernt Bentzen, one of Nansen's crew on the *Fram*, will also go with the expedition. At Archangel seventy-five draught dogs, specially procured from Siberia, will be taken on board. Thence Mr. Wellman proposes to steam for Cape Flora, in Franz Josef Land, where

a supply station will probably be established. Pushing on to the north of the archipelago, the party will, according to present plans, winter between 82° and 83° north, making a renewed start with sledges in February, 1899. A special feature will be the use of small sledges capable of being drawn by a single dog. They will be made on an entirely new plan, a tube-like construction of tinned copper being provided with runners on its two sides, and so shaped that if it tilts over it always comes down on one or other pair of runners. It will be air-tight, and will float in water. As the supplies stored within are needed, the tube will be ripped open and discarded. Fifty of these sledges, weighing little over 100 lbs. each, will be taken, as well as a small canvas boat in which to cross possible channels and water-holes, and also to provide shelter by night. Allowing an average rate of 10 miles a day, Mr. Wellman hopes that it may be possible to cover the distance to the pole and back, roughly a thousand miles, by the beginning of June, at which time the melting of the snow makes travel exceedingly difficult. It will be seen that every precaution has been taken to make the expedition a success, but how far this will be attained will of course depend on the nature of the surface to be travelled over.

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

M. de Lapparent's 'Physical Geography.'—Prof. de Lapparent has just issued a second edition of his important work on physical geography,* the first edition of which was noticed with some detail in the *Journal*, vol. viii. (1896) p. 65. It is extremely satisfactory to find that a book of so original and so thoroughly scientific a character has proved such a success as to require a new edition within two years. The opportunity has been taken, not only to revise the text and to introduce a large number of additional illustrations, but also to enlarge the work by the addition of two new chapters; although unfortunately, the book still lacks that essential aid to the student, an alphabetic index. The new chapters deal with the oceans and with the classification of mountains. The former summarizes very briefly the main facts of oceanography, so far as regards the relief of the floor of the oceans and the chief currents, in the light of the most recent researches. The chapter on mountains is more important. The author confesses that he looks with mistrust on the multiplication of new terms unless to express ideas which are truly and entirely new, and that he does not wholly approve of classifications, the distinctions of which are apt to prove more apparent than real. He protests against the abuse of genetic relations, insisting that in geography an actual plateau must not be called a mountain because it has been produced by erosion from some previously existing mountain. He ingeniously defines a mountain as a land-form to reach the summit of which one must *mount* up from every side. The terminology introduced by Prof. Supan is, in Prof. de Lapparent's opinion, unsuited for translation into French, and if this be the case, it is unsuited for direct translation into English also, much as one could wish the case to be otherwise. Prof. de Lapparent prefers to classify mountains into three genetic groups, according to their formation by *accumulation* (volcanic, glacial, or æolian), *deformation* (laccolites, folding, or dislocation), and *erosion*, subdividing each group into types represented by the name of some locality. The question is a very interesting one, and the last word on either side has yet to be said.

The Determination of Geographical Positions without Astronomical Instruments.—An important addition has been made to the long series of

* 'Leçons de Géographie Physique par Albert de Lapparent.' Deuxième Edition, revue et augmentée avec 163 figures dans le texte et une planche en couleurs. Paris: Masson et Cie., 1898. Pp. 718.

"Erganzungshefte" of *Petermanns Mittheilungen* by the publication of No. 123, a paper by Prof. Dr. Paul Harzer, of Kiel, on methods of determining latitudes and longitudes without the use of the delicate astronomical instruments so troublesome to the traveller. The first part of this excellent monograph is devoted to a statement of the astronomical problems to be solved in ascertaining positions; the observations required, and the methods of their reduction, are explained by the help of mathematics which should not be beyond the reach of the ordinary student, special attention being directed to the calculation of the values of errors. This enables the reader to understand the use of the simple apparatus described in the second part of the memoir. Four upright posts are fixed in the ground, and on these, at a convenient height, a light wooden frame in the form of a parallelogram is supported. A string is passed over the two longer sides of this frame, and to the free ends a weight of one to two pounds is attached, the weight being immersed in a bucket of water so as to bring the system to rest as quickly as possible if disturbed by wind. The string thus forms a triangle which remains in a vertical plane, and the frame is so placed that this plane does not form any considerable angle with the meridian. Similar triangles may be placed on each side of the central one, with their planes conveniently arranged so as to radiate from the observer. The strings are whitened with chalk if necessary, and illuminated by means of a lantern placed on a table at the side. Observations, of course, consist in timing the passage of the moon or selected stars across the triangular planes of the strings. Dr. Harzer gives a full series of typical observations, and examples of the mode of working them out and estimating errors, and he obtains much more satisfactory results than might have been expected from the crude apparatus employed. The last part of the memoir gives a brief recapitulation in a form suitable for practical work.

GENERAL.

University Teaching of Geography in Belgium.—The New University of Brussels has issued a short statement of the plan of teaching in its Geographical Institute, which was founded in March, 1898, under the direction of M. Elisée Reclus, who is assisted by eleven specialists. The New University is a body entirely free from external control, and has planned the geographical course "in what appears to be the most logical order, conformably to the ideals of every geographer who would be at the same time a man of science, a scholar, and a good worker." The programme is formidable, demanding preliminary courses in natural history, chemistry and physics, mathematics, elementary geography, history, the English, German, Russian, and neo-Latin languages, and drawing. Latin and Greek, however, are not required. The first year at the Geographical Institute demands fifteen hours per week, of which three hours are devoted to mathematical geography, two hours each to physical geography, languages, and drawing, and one hour each to cosmography, meteorology, geology, biology, photography of maps and reliefs. The course commences with a lecture on the position of geography amongst the sciences, and excursions are prescribed for the holidays. In the second year, three hours a week are shared between cosmography and mathematical geography; four hours are given to drawing, including map-construction; two hours each to physical geography, geology, and languages; and one hour each to botanical geography and anthropology. The third year demands three hours a week for the history of geography; two each for comparative geography, commercial geography, and the construction of maps; and one hour a week for each of the following: geodesy, geology, zoogeography, anthropology, medical geography, ethnography and colonisation, toponymy, or the science of place-names.

The holidays are to be occupied by excursions and "the science and practise of exploration." The scheme certainly appears to be both thorough and complete, although the allocation of time may possibly be found capable of improvement. The regular students of the Institute will be expected to write memoirs, as part of their training, when sufficiently advanced, and to draw maps, which may be published by the Institute and become its property. This effort to establish a great school of geography will command the sympathy of geographers, who will look forward with interest to the results of the experiment.

System of Orthography for Native Names in the Congo State.—A few years ago the *Mouvement Géographique* published a system of orthography to be followed by that journal in dealing with native names of places. This has been generally followed also by the officers of the Congo State, and an official note has now been issued, laying down general rules for the spelling of place-names, in which the former system has been slightly modified and made more simple (*M. G.* 1898, No. 11). All the vowels except *u*, and thirteen of the consonants, are pronounced as in French, while *u* has the sound of the French *ou*. So far the system agrees with that laid down by the Royal Geographical Society, except that *j* is pronounced as in France, and *dj* is used for the sound of that letter in English. For the long sound of the vowels the circumflex is employed. As regards the other letters, the system harmonizes on the whole with that of our Society; thus *c*, *q*, *x*, *ph*, are discarded, *g* is always hard, *s* has the sharp hissing sound, and *sh*, *w*, and *y* are used as in English. The combination *ch* is not employed, however, its sound being shown by the use of *tsh*, while *dsh* is also allowed as distinct from *dj*; double consonants, again, are not allowed. Stress is laid on the distinction between *wa*, *we*, etc., and *ua*, *ue*, etc., the latter representing two distinct vowel sounds in juxtaposition. Rules which apply specially to Africa are (1) that by which the prefix is discarded in such names as N'Doruma, and (2) that which forbids the use of the terminal *s* to denote the plural in names of tribes. The system has the advantage of being consistent throughout, the same sound being always represented by the same symbol. This holds even in the case of the compound sounds *tsh* and *dj*, whereby the use of special symbols, as in English, is obviated. No provision is made, however, for the representation of certain sounds of which account is taken in our system, *e.g.* those represented in English by *aw* (as in *lawn*) and *th*, while both systems alike fail to provide a satisfactory means of distinguishing the sound of *u* in *up* from that of the same letter in *full*.

Testimonial to Dr. H. Kiepert.—In recognition of his great services to geography, both ancient and modern, the friends of Dr. H. Kiepert have resolved to present to him, on his eightieth birthday, which occurs on July 31, a memorial volume containing a series of original papers bearing on ancient geography. Contributions have been offered by such well-known writers as Mommsen, Hübner, Partsch, Benndorf, Oberhummer, Kretschmer, and others; and the work will be brought out under the auspices of the publishing firm of Dietrich Reimer. The price has been fixed at 20 marks, before publication, and an early intimation of the names of intending subscribers, a list of whom will appear on the fly-leaf, is requested by the publisher.

OBITUARY OF THE YEAR.

The following is a list of Fellows of the Society who have died during the year 1897–98 (April 30):—

Sir Rutherford Alcock, K.C.B., F.R.S.; Captain Thomas Alderton; Lieut. E. G. Alston; James Anderson; Major G. W. Bartram, R.E.; James Bateman, F.R.S.;

J. Theodore Bent; James Brand; David Brandon; Right Hon. Lord Monk Bretton; John Buckley; A. F. Bundock; Lieut. F. H. S. Cator; Admiral R. Coote; Sir Langham Dale, K.C.M.G.; W. B. D'Almeida; Baron Oscar Dickson; A. M. Dunlop; George Elder; Ney Elias; Rev. E. W. Ford; Sir A. W. Franks, K.C.B.; Henry Gale; Ernest Giles; Charles Grey; Sir Brandford Griffith, K.C.M.G.; A. G. S. Hawes; G. C. Hawker; James Heawood; Boyd Horsbrugh; Lieut.-General Sir Drummond Jervois, G.C.M.G., C.B.; T. B. Johnston; Sir Polydore de Keyser; Joseph King; B. T. Knights; C. J. Leaf; F. L. Leveaux; Hon. G. A. Lloyd; Mrs. E. Maberley; Edward Mackeson; H. Mann; H. M. Matheson; Lord Monkswell; J. Carrick Moore; W. V. Murray; George Norton; Henry Nourse; E. D. Ogilvie; James Parlane; Captain Crawford Pasco; S. E. Peal; Captain Francis Peel; James Robert Phillips; S. C. Potter; John Fish Pownall; Colonel Sir Norman W. D. Pringle, Baronet; R. C. Rapier; Sir W. C. F. Robinson, G.C.M.G.; Joseph Ruston; E. E. Sabel; H. Sylvester Samuels; Hercules Scott; H. B. Simonson; J. Travers Smith; Sir Walter E. de Souza; E. W. Stanton; Colonel H. C. B. Tanner; General W. B. Thomson; Sir J. B. Thurston; Walter Turnbull; General Blois Turner; J. E. Turner; T. E. Twycross; W. R. Vines; R. B. Wade; General H. J. Warre; Major R. P. Warren; John Whitehead; Percy Whitehead; William Wickham, M.P.; Robert Wilson; The Bishop of Winchester; Major Alexander Wood.

MEETINGS OF THE ROYAL GEOGRAPHICAL SOCIETY, SESSION 1897-98.

Anniversary Meeting, May 23, 1898.—Sir Clements Markham, K.C.B., F.R.S., President, in the Chair.

The Secretary read the Minutes of the last Anniversary Meeting.

Elections.—*Ernest Wynne Martelli; Colonel Edmund S. Walcott, C.B.*

The Presentation of the awards for the year then took place.

The President: Dr. Sven Hedin, the Council has awarded to you the Founders' Medal of the Royal Geographical Society, for your important journey through Central Asia, during which you surveyed the glaciers of Mustagh-ata, and crossed for the first time the desert of Takla Makan, made important discoveries in the Tian-shan region, and solved the geographical problem connected with Lob-nor. We also had in our minds your previous journeys, and the remarkably excellent training as a geographer to which, from your earliest years, you have subjected yourself, and which enabled you to perform your journeys, so that they should be alike most important and useful to science, and also most honourable to yourself. I have great pleasure in presenting you with this medal.

Dr. Sven Hedin: I very highly appreciate the great distinction which to-day has been bestowed upon me, and at the same time I express my deep and warm regard for the Royal Geographical Society. I desire to say that, of the ten medals which I have received for my last journey across Asia, I regard the one which I have the honour to receive to-day from the Royal Geographical Society, as the most important and the most precious to me, as it has been conferred upon me by the most renowned and the greatest of all the Geographical Societies in the world. I am proud to find myself placed at the side of my great predecessors and teachers, Carey, Ney Elias, Holdich, Littledale, Younghusband, and Prjevalsky, and I feel the distinction to be too great in comparison with the work which I have performed;

but I allow myself to regard it as an encouragement to new researches into the interior of that great continent, where so much is still left to be done. It is a very great pleasure for me to find my name inscribed on the roll of honour of the Royal Geographical Society. The medal, which in itself is of such high value, is all the more precious to me inasmuch as I have had the honour to receive it from the hands of the illustrious President of that Society.

The PRESIDENT: Mr. Carter (Secretary of the U.S. Embassy), I am happy to be able to inform you that the Patron's medal of the R.G.S. has been assigned to Lieut. Peary. I think this Society has conferred its medal upon most of the principal American arctic explorers, beginning with Dr. Kane, who was an old friend of mine years before he started upon his exploration, and including Mr. Hayes and General Greeley; but I think Lieut. Peary stands quite apart from the distinguished men I have just mentioned. He was not so much an arctic explorer as a glacier explorer. In that, he stands quite alone, and first. His journey with the dogs over 1200 miles on the inland ice of Greenland is unequalled, and he was completely successful in achieving that which he wished to do. He settled the question of the northern limit of the great glacier of Greenland. I cannot help alluding to another piece of service done by Lieut. Peary, which is perhaps not so much geographical as ethnological, and that is his admirable treatment of that interesting tribe, the Arctic Highlanders. If it had not been for Lieut. Peary, they would have been extinguished, but he supplied them with means of obtaining their food, which they never had before. I have great pleasure in placing in your hands, for transmission to Lieut. Peary, the Patron's medal of the R.G.S.

Mr. CARTER: I am charged by the Ambassador to express his deep regret for not being able to be here present in person, and to thank the Royal Geographical Society for the great honour which has been bestowed upon his countryman.

The PRESIDENT: Mr. H. Warington Smyth, the Murchison Grant has been assigned to you by the Council of the Royal Geographical Society, for the large amount of geographical information which is contained in your three journeys in Siam, and I think we have looked more particularly to the admirable way in which these journeys have been described by you, for we consider it is one of the most valuable qualifications of a geographer that he should be able to describe the country in which he travels well and clearly. I cannot help saying, as President of this Society, that it is an extra pleasure to be able to hand this grant to you, Mr. Smyth, because we remember that your grandfather was the principal founder of this Society, and that when he was its President, by his great administrative and financial skill, he saved our Society when it was at its lowest ebb. We remember also that your father was an honoured member of our Council, and we feel confident that you will follow in their footsteps.

Mr. WARINGTON SMYTH: I have to thank you, Sir Clements—you and the Council of the R.G.S.—for doing me this honour, which I certainly never expected to attain to.

The PRESIDENT: The Back Grant has been given to Mr. George P. Tate, for his excellent work in surveying, especially in Baluchistan. I have to request that Sir Thomas Holdich will take charge of the grant, for transmission to Mr. Tate.

The PRESIDENT: Mr. Edmund T. Garwood will receive the Gill Memorial, for the work he did in physical geography whilst surveying in two expeditions in Spitsbergen with Sir Martin Conway. Mr. Sweet had undertaken to receive the Cuthbert Peek Grant for Mr. Poulett Weatherley, which has been granted to him for the work he has done in navigating Lake Bangweolo. We have felt that Mr. Weatherley also deserves recognition for his treatment of the natives, his sympathy for them, and the just way in which he has always treated them, and

for the great influence he has acquired over the chiefs. He has been working quite alone in Central Africa for four years.

The President then delivered his Annual Address (see p. 1).

Sir ANTHONY HOSKINS: A very grateful task devolves upon me, and that is to propose a vote of thanks to the President of the Society for the address which he has given us, and which, I venture to think, supplies an admirable summary of the work which has been undertaken by geographical explorers and by the R.G.S. during the past year. That the Society has been so successful, as he has shown in his concluding words, is, I am sure you will all agree, largely due to his own admirable work—work which has not been confined to the financial and administrative side of the Society's requirements, but has extended over a very large area besides, both literary and social. With reference to the latter, I would allude to the reception of the foreign geographical representatives and such occasions as that of which we had an example the other night, when we celebrated the 400th anniversary of Vasco da Gama, and were indebted to our President for an address of great interest to the large audience present. I am sure, therefore, you will all cordially unite in a vote of thanks to Sir Clements Markham for his address to-day.

Sir FREDERICK YOUNG: I am quite sure that the proposal made by Sir Anthony Hoskins does not require any seconder, but I was most anxious to say a word or two with regard to the most interesting and comprehensive address with which you have just favoured us. In one of your opening sentences you referred particularly to the coming antarctic expedition. I am here as the representative of another great society—the Royal Colonial Institute—of whose Council several members are present this afternoon. The attention of our Council has been long since called to the efforts of the Royal Geographical Society in the direction of the great object of antarctic exploration, and we have already urged upon the Government to the best of our power the duty of encouraging and giving their sanction to this most admirable object. At the last annual meeting of our society, at which I had the honour to preside, reference was made to this very fact, and we told our Fellows that we are most anxious to do everything on our part to urge the Government to make all those efforts which we feel it is their duty to do with reference to this great question, in which other nations are taking the lead. It is hardly creditable to us that this should be so, and I think we should not be content to follow, but should be determined to take precedence of other nations in regard to an enterprise of this importance. I cannot sit down without thanking you very much for your address, and congratulating both you and the Society that you are restored again to health.

The PRESIDENT: In thanking the meeting for its vote, and my friends the proposer and seconder for what they have so kindly said, I can only express my regret that, through the illness which has attacked me, I have not been able to attend to your interests so well as I have done in previous years.

The visitors then withdrew, and the President having appointed Mr. Delmar Morgan and Mr. H. Leonard scrutineers, the election of the Council for the ensuing year was proceeded with.

The Hon. Secretary then read the report of the Council for the past year; this will be published in the Year-Book for 1899.

THE BALLOT FOR THE NEW COUNCIL.

The PRESIDENT then announced that the Council as proposed had been elected.

The list is as follows, the names of new members, or those who change office, being printed in *italics*:—

President:—Sir Clements R. Markham, K.C.B., F.R.S., F.S.A. *Vice-Presidents*: *Hon. George C. Brodrick*; Right Hon. Sir George D. Taubman Goldie, K.C.M.G.; *Admiral Sir F. Leopold McClintock*, K.C.B., D.C.L., F.R.S.; General Sir R. Strachey, R.E., G.C.S.I., F.R.S.; Admiral Sir W. J. L. Wharton, K.C.B., F.R.S.; General Sir Chas. W. Wilson, R.E., K.C.B., K.C.M.G. *Treasurer*: Edward L. Somers Cocks. *Trustees*: Right Hon. Sir John Lubbock, Bart., F.R.S., M.P.; Cuthbert E. Peek, F.S.A. *Honorary Secretaries*: Major Leonard Darwin, R.E.; James F. Hughes. *Foreign Secretary*: Sir John Kirk, K.C.B., G.C.M.G., F.R.S. *Members of Council*: Lord Belhaven and Stenton; W. T. Blanford, LL.D., F.R.S.; Colonel George Earl Church; *Clinton T. Dent*; Colonel William Everett, C.M.G.; Colonel J. Farquharson, C.B., R.E.; *Lieut.-Colonel Sir Thomas Hungerford Holdich*, R.E., K.C.I.E., C.B.; Admiral Sir Anthony H. Hoskins, G.C.B.; *St. George R. Littledale*; Right Hon. Lord Loch, G.C.B., G.C.M.G., etc.; Alfred P. Maudslay; General Sir H. W. Norman, G.C.B., G.C.M.G.; Surg.-Major Sir George S. Robertson, K.C.S.I.; *George S. Mackenzie*, C.B.; P. L. Sclater, F.R.S.; *Frederick Courtney Selous*; *Herbert Warington Smyth*; Lord Stanmore, G.C.M.G.; Colonel Sir Henry R. Thuillier, R.E., K.C.I.E.; Admiral the Hon. W. J. Ward; *Colonel Charles Moore Watson*, R.E., C.M.G.

THE ANNIVERSARY DINNER.

In the evening the anniversary dinner took place at the Hotel Cecil. The President, Sir Clements Markham, K.C.B., occupied the chair. There were about 220 present, including the following distinguished guests: The Minister of Sweden and Norway, the Chinese Minister, the Marquis of Lothian, the Earl of Camperdown, Lord Strathcona, General Sir William Lockhart, Sir Herbert Maxwell, General Sir Evelyn Wood, Sir Henry Dering, Admiral Sir R. Macdonald, General Sir Edwin Markham, Sir Francis Mowatt, Sir William White, Sir Frederick Abel, Sir John Evans, Sir Archibald Geikie, Sir E. Franklin, Sir Henry Longley, Sir George Chambers, Admiral Sir C. E. Domville, the Astronomer Royal, Sir Robert Ball, Rev. Dr. Welldon, Prof. Rücker, Dr. Sven Hedin, Dr. Thoroddsen.

The PRESIDENT proposed the toasts of "The Queen," "The Prince of Wales and the Duke of York," and "The Army and Navy." Admiral Sir C. E. DOMVILLE replied for the Navy, and General Sir W. LOCKHART for the Army. The PRESIDENT proposed "The Medallists," to which Dr. SVEN HEDIN replied. Sir HENRY NORMAN proposed "The Guests," which was responded to by the Chinese Minister and Dr. WELLDON. Major DARWIN proposed "The Allied Sciences," to which the Astronomer Royal and Sir ARCHIBALD GEIKIE replied. In conclusion Lord LOTHIAN proposed the toast of "The President."

Afternoon Technical Meeting, Wednesday, May 25.—SIR CLEMENTS MARKHAM, K.C.B., F.R.S., President, in the Chair.

The paper read was:—

"The Influence of Geographical Conditions on Social Development." By Prof. Patrick Geddes.

Thirteenth Ordinary Meeting, June 6, 1898.—SIR CLEMENTS MARKHAM, K.C.B., F.R.S., President, in the Chair.

ELECTIONS.—*Herbert Sanford Claye*; *Devi Daval*; *John Davidson Milburn*; *Sir Robert Pullar, J.P., F.R.S.E.*; *Robert Lucas Tooth*; *Edward Strong Torney*; *Captain Henry Hampden Wigram* (*Scots Guards*).

The Paper read was:—

"Circumnavigation of Lake Bangweulu." By Poulett Weatherley.

Fourteenth Ordinary Meeting, June 20, 1898.—Sir CLEMENTS MARKHAM, K.C.B., F.R.S., President, in the Chair.

ELECTIONS.—*William Bowyer; Charles William Lloyd Bulpett; Harold Gilmore Campion; Arthur Elstob; F. R. S. Gervers (Lieut. R.E.); William Henry Hall; David William Harwood; George Duncan McGrigor; Alfred J. Paten; Coningsby C. Sibthorp, J.P.; James B. Taylor; Montagu R. Waldo-Sibthorp, J.P., D.L.; Leedham White, F.C.S.*

GENERAL WOODTHORPE.

The PRESIDENT: Before beginning the work of the evening, I cannot refrain from referring to the great loss the Society has sustained by the very unexpected death of General Woodthorpe. He had been working on the Indian frontier, amidst pestiferous jungles and snowy peaks, for upwards of thirty years. When I first remember him, he had just written that interesting narrative of the Lushai expedition, which I think was in 1872. He will be a great loss to the Society. He had only gone out to India to finish his time for a couple of years, and then we looked forward to the great advantage of having him on our Council. His services were most valuable to the State, and I believe he was one of the most popular officers in India, so that his loss will be mourned by a very large circle of friends.

The Paper read was:—

"Tirah: the Geographical Results of the recent Afridi Campaign." By Colonel Sir Thomas Hungerford Holdich, R.E., K.C.I.E., C.B.

GEOGRAPHICAL LITERATURE OF THE MONTH.

Additions to the Library.

By HUGH ROBERT MILL, D.Sc., *Librarian*, R.G.S.

THE following abbreviations of nouns and the adjectives derived from them are employed to indicate the source of articles from other publications. Geographical names are in each case written in full:—

A. = Academy, Academie, Akademie.
Ann. = Annals, Annales, Annalen.
B. = Bulletin, Bollettino, Boletim.
Com. = Commerce, Commercial.
C. Rd. = Comptes Rendus.
Erdk. = Erdkunde.
G. = Geography, Geographie, Geografia.
Ges. = Gesellschaft.
I. = Institute, Institution.
Iz. = Izvestiya.
J. = Journal.
M. = Mitteilungen.
Mag. = Magazine.
P. = Proceedings.
R. = Royal.
Rev. = Review, Revue, Revista.
S. = Society, Société, Selskab.
Sitzb. = Sitzungsbericht.
T. = Transactions.
V. = Verein.
Verh. = Verhandlungen.
W. = Wissenschaft, and compounds
Z. = Zeitschrift.
Zap. = Zapiski.

On account of the ambiguity of the words *octavo*, *quarto*, etc., the size of books in the list below is denoted by the length and breadth of the cover in inches to the nearest half-inch. The size of the *Journal* is 10 × 6½.

EUROPE.

Alps—Karren. *Petermanns M.* **44** (1898): 69–71. **Eckert.**

Die Karren oder Schratten. Resultate der Untersuchungen über Karrenfelder in den deutschen Alpen. Von Dr. Max Eckert.

Karren are peculiar fissures in the rocky surface of some mountainous regions, and this paper deals with the study of their form with a view to determine their origin.

Alps—Western. **Coolidge.**

W. A. B. Coolidge. Le Massif de Scolette. Lyon: Imp. Mougin-Rusand, 1898. Size 10 × 6½, pp. 30. *Map and Illustration.*

A detailed description, with annotated bibliography, of the little-known western portion of the Alpine chain between the Fréjus tunnel (usually called the Mont Cenis tunnel) and Mont Cenis, the eastern part of which was described last year by the same author.

Austria. ——

Publicationen für die Internationale Erdmessung. Die Astronomisch-Geodätischen Arbeiten des K. und K. Militär-Geographischen Institutes in Wien. X. Band. Das Präcisions-Nivellement in der Oesterreichisch-Ungarischen Monarchie. III. Nordöstlicher Theil. Herausgegeben vom K. und K. Militär-Geographischen Institute. Wien, 1897. Size 12 × 9½, pp. viii. and 202. *Map. Presented by the Institute.*

Austria—Dalmatia. *M.G. Ges. Wien* **40** (1897): 811–827. **Kerner.**

Das mittlere Kerkathal. Von Dr. Fritz v. Kerner. *With Plates.*

The six photographs accompanying this paper are views of the waterfalls on the Kerka.

Austria—Geographical activity. *M.G. Ges. Wien* **40** (1897): 832–853. ——

Bericht über die Leistungen der österreichischen Staatsinstitute und Vereine auf dem Gebiete der geographischen und verwandten Wissenschaften im Jahre 1896.

A summary of the work done during 1896 by the Austro-Hungarian Military Geographical Institute, Geological Institute, Statistical Department of the Ministry of Commerce, Central Statistical Commission, Institute for Meteorology and Terrestrial Magnetism, and the Scientific Exploration of Bohemia. It would have added completeness to the article if the universities and larger geographical associations had also been dealt with.

Austria—Language. *G.Z.* **4** (1898): 241–265. **Zemmrich.**

Deutsches und tschechisches Sprachgebiet. Von Dr. J. Zemmrich. *With Map.*

On the distribution of language in Bohemia and Moravia, showing the area of Chech speech, with the fringing area of German, and the various outlying islands of either language. The areas of mixed speech are curiously small.

Austria—Tyrol. *Appalachia* **8** (1898): 337–350. **Balch.**

Reminiscences of Tyrol. By Edwin Swift Balch. *With Illustrations.*

Austria—Vienna. **Penck.**

Vorträge des Vereines zur Verbreitung naturwissenschaftlicher Kenntnisse in Wien. XXXV. Jahrgang—Heft 18. Die geographische Lage von Wien. Vortrag, gehalten den 28 November 1894. Von Albrecht Penck. Wien, 1895. Size 7½ × 5, pp. 34. *Presented by the Author.*

On the geographical position of Vienna, and the causes of the growth of that city.

Austria—Vienna. **Zannoni.**

Austria-Ungheria. La Colonia Italiana in Vienna. Rapporto del cav. Giacomo Zannoni.—Bollettino del Ministero degli Affari Esteri. Aprile, 1898. Roma, Libreria Bocca. Size 9½ × 6½, pp. 14.

Balkan Peninsula. *Scottish G. Mag.* **14** (1898): 225–241. **Callan.**

Lands and Peoples of the Balkans. By the Rev. Hugh Callan, M.A.

Eastern Mediterranean Lands. *Ann. G.* **7** (1898): 112–141. **Philippson.**

La tectonique de l'Égéide. Par M. A. Philippson. *With Map.*

Prof. Phillipson summarizes his extensive researches on the physical geography and geology of the Greek peninsula and Asia Minor, and shows in a clear map the main structural lines which determine the composite surface forms of the region.

France—Ardèche. *B.S.G. Lyon* **14** (1898): 751–765. **Bourdin.**

L'Ardèche. Par M. Louis Bourdin.

France—Dauphiné. **Martel.**

Les Abimes du Dauphiné. [Par E. A. Martel.] Size 9½ × 6, pp. 60. *Plans.*

France—Dunes. *B.S.G. Com. Bordeaux* **21** (1898): 159–173. **Duffart.**

Distribution géographique des dunes continentales de Gascogne. Par Charles Duffart. *With Map and Section.*

The map distinguishes the modern dunes dating no farther back than the fourteenth century, the ancient littoral dunes of historic time, and the ancient continental dunes of prehistoric times.

France—Lakes. *Petermanns M.* **44** (1898): 86–90. **Halbfass.**

Die Seen Frankreichs. Von W. Halbfass.

A review of Delabecque's work.

France—Population. *Ann. G.* **7** (1898): 172–177. **Milhaud.**

La densité de la population française en 1801, 1846, 1896. Par M. A. Milhaud. *With Maps.*

The density of population is shown on the maps by shading, the department being the unit.

France—Rhone. *Rev. Scientifique* **9** (1898): 487–491, 516–523, 554–559. **Souleyre.**

L'aménagement industriel du Rhône. Par M. A. Souleyre.

A plea for the more complete utilisation for the river Rhone by improving it for navigation, for irrigation, and for the production of power.

France—Time-Standard. *Rev. Scientifique* **9** (1898): 579–581. **Bouquet de la Grye.**

L'heure nationale. Par M. Bouquet de la Grye.

An appeal for the old order of things, and against the introduction of Western European time in France.

Germany—Bavaria. *Sitz. A. W. München* (1898): 3–18. **Gümbel.**

Ueber die in den letzten Jahren in Bayern wahrgenommenen Erdbeben. Von C. W. v. Gümbel.

A list of the authentic earthquakes recorded in Bavaria from 1117 to 1897. The years in which earthquakes were recorded were 1117, 1348, 1690, 1822, 1865, 1868, 1870, 1886, 1888, and every year since except 1892.

Germany—Bavaria. **Muntz.**

Tour du Monde **3** (1897): 313, 325, 337; **4** (1898): 217, 229.

En Allemagne. Voyages aux Villes historiques de la Franconie. Par M. Eugène Müntz. *With Illustrations.*

Germany—Heligoland. **Servières.**

A travers le Monde, Tour du Monde **4** (1898): 105–108.

Notes sur Helgoland. Par Georges Servières. *With Illustrations.*

Germany—Hunsrück. **Meyer.**

Forschungen zur deutschen Landes- und Volkskunde . . . herausgegeben von Dr. A. Kirchhoff. Elfter Band, Heft 3. Zur Kenntnis des Hunsrücks. Von Dr. Fritz Meyer. Stuttgart: J. Engelhorn, 1898. Size 9½ × 6½, pp. [34]. *Map.*

A systematic study of the upland region of the Hunsrück, with an orographical contoured map on the scale of 1 : 240,000, the effect of which is not improved by the isolation of the region from its surroundings, nor by the manner of colouring.

Holland. *Travel* **3** (1898): 11–17. **Crowther.**

Holland, the Country below the Sea. By Henry Crowther. *With Illustrations.*

Iceland. *Globus* **73** (1898): 292–294. **Gebhardt.**

Statistisches aus Island. Von Dr. phil. August Gebhardt.

Comparative statistics of Iceland, showing how the population sank from nearly 105,000 in 1096 to about 47,000 in 1801, and has since risen gradually to nearly 71,000 in 1890; and dealing also historically with longevity, natural resources, and trade.

Italy. *Rendiconti R.A. Lincei* **7** (1898): 103–126. **Ashby.**

Sul vero sito del lago Regillo. Nota del sig. Tommaso Ashby. *With Map and Illustrations.*

A summary of the controversies as to the situation of Lake Regillus, with an opinion as to its true site being a dry lake-basin a short distance north of Frascati.

Portugal—Lisbon. *Ann. Hydrographie* **26** (1898): 1–36. ——

Segelanweisung für den Hafen von Lissabon, nach der neuesten amtlichen Veröffentlichung der portugiesischen Admiralität.

Sailing directions for Lisbon harbour.

Pyrenees. *Ann. G.* **7** (1898): 166–172. **Dognon.**

Sur l'orientation de la chaîne des Pyrénées d'après Strabon. Par M. P. Dognon. *With Diagram.*

Illustrating Strabo's view of the Pyrenees as a range running north and south.

Rockall. *T.R. Irish A.* **31** (1897): 39–98. ——

Notes on Rockall Island and Bank, with an Account of the Petrology of Rockall, and of its Winds, Currents, etc.: with Reports on the Ornithology, the Invertebrate Fauna of the Bank, and on its Previous History. *With Plates.*

An abstract of this paper appeared in the *Journal* for January (vol. xi. p. 48).

Russia. *M.G. Ges. Wien* **41** (1898): 273–285. **Diener.**

Bericht über die Excursionen des VII. internationalen Geologen-Congresses in den Ural, den Kaukasus und die Krim. Von Dr. C. Diener.

Russia. **Trevor-Battye.**

A Northern Highway of the Tsar. By Aubyn Trevor-Battye. London: A. Constable & Co., 1898. Size 8 × 5¼, pp. xiv. and 256. *Portrait, Map, and Illustrations. Price* 6*s. Presented by the Publishers.*

This gracefully written book is a sequel to the author's larger work, 'Ice-bound on Kolguev,' and describes his return journey from Kolguev at the season of the year between autumn and winter, when all traffic, even the postal service, is usually suspended on the Tundra. The route pursued was up the Pechora to Ust Tsilma, and thence across country westwards to Archangel, and then south to Vologda.

Russia—Finland. *M.G. Ges. Wien* **41** (1898): 219–261. **Dierkes.**

Land und Leute in Finnland. Von Leopoldine von Morawetz Dierkes.

Russia—Historical. *G.Z.* **4** (1898): 268–274. **Ratzel.**

Politisch-geographische Rückblicke. III. Das russische Reich. Von Prof. Dr. Friedrich Ratzel.

A sketch of the historical development and present area of the Russian empire, viewed from the standpoint of political geography.

Russia—Lapland. *Rev. Maritime* **136** (1898): 359–364. **Grévin.**

La côte Mourmane; traduit de l'allemand. Par G. Grévin.

Russia—Novaya Zemlya. *Iz. Imp. Russian G.S.* **33** (1897): 360–366. **Bukhteyeff.**

Hydrographical researches of the transport *Samoyed* on Novaya Zemlya. By A. Bukhteyeff. [In Russian.] *With Maps.*

On hydrographic observations made on the coast of Novaya Zemlya in 1896; the maps show soundings in Byelushya bay, and a comparison of the coast-line of the bay as determined in 1896 with the rough sketch made in 1839.

Russia—Novorossisk. *B.S.G. Marseille* **21** (1897): 374–380. **Scheult.**

Le port de Novorossisk. Par le commandant E. Scheult.

A detailed description of the town and port of Novorossisk on the Black Sea.

Russia—Odessa. *B.S.G. Marseille* **21** (1897): 123–142. **Bourge.**

Odessa. Par M. G. Bourge.

Russia—Odessa. *B.S.G. Marseille* **21** (1897): 143–149. **Saint-Yves and Zablondowski.**

Le développement économique d'Odessa. Par MM. G. Saint-Yves et L. Zablondowski.

Russia—Olonetz. *Iz. Imp. Russian G.S.* **32** (1897): 440–441. **Lentsi.**

Magnetic anomalies in the Northern part of Podenetz district, Gov. Olonetz. By Lentsi. *Map.* [In Russian.]

Russia—People. *Fortnightly Rev.* **63** (1898): 147–159. **Dillon.**

The Struggle of Religions and Races in Russia. By Dr. E. J. Dillon.

An analysis of the statistics of populations and religions in Russia.

Russia—Population. ——

Premier Recensement Général de la Population de l'Empire de Russie, 1897. Publication du Comité Central de Statistique au Ministère de l'Intérieur. Livraison 1. Population de l'Empire recensée le 28 Janvier—9 Février 1897; par districts. D'après les Calculations locales. (St. Pétersbourg, 1898); Livraison 2. Population des Villes. [In Russian.] St. Pétersbourg, 1897. Size 9 × 7¼. *Presented by the Comité Central de Statistique, St. Petersburg.*

The tables are printed with headings in Russian and French.

Russia—Southern Lakes. **Sokolow.**

Verh. Russ.-K. Mineralog. Ges. St. Petersburg **35** (1897): 1–18.

Beiträge zur Kenntniss der Limane Südrusslands. Von Dr. N. Sokolow.

Russia—Ural. *Iz. Imp. Russian G.S.* **33** (1897): 366–368. **Abels.**

The altitudes of Alexandrovskay Sopka and Taganai, S. Ural Mountains, in the vicinity of the city Slatoust. By G. Abels. [In Russian.]

Russia—Volga. *Travel* **2** (1898): 445–449. **Page.**

Up the Volga. By John Ll. Warden Page. *With Illustrations.*

Russia—Volhynia. *Annuaire Géolog. et Minéralog. Russie* **2** (1897): 51–63. **Tutkowski.**

Zur Geologie des Lutzk'schen Kreises im Gouv. Wolhynien. 2. Ueber den See-Löss und den subaëralen Löss. Vorläufiger Bericht von P. Tutkowski.

Spain. *B.S.G. Madrid* **39** (1897): 196–202. **Jiménez.**

Estudio estratégico de la Peninsula Ibérica, desde el punto de vista del ingeniero, por el Coronel del Cuerpo D. Francisco Roldán y Vizcaino. Por D. Eusebio Jiménez.

Analysis of a work on the strategical geography of the Iberian peninsula, by Colonel Roldan y Vizcaino.

Spain. *Globus* **73** (1898): 174–177. **Kartz.**

Guetaria im Baskenlande. Eine Erinnerung an den ersten Weltumsegler. Von Dr. Kartz.

On a visit to the birth-place of Del Cano, with references to his first circumnavigation of the globe.

Spain—Andalusia. *Contemporary Rev.* **73** (1898): 714–726. **Pennell.**

In Andalusia with a Bicycle. By Joseph Pennell.

A tour from Gibraltar through Tarifa and Seville to Granada, which was taken as a centre for short tours; then to Malaga, along the coast to Motril, and back to Granada by mountain roads.

Spain and Portugal. **Baedeker.**

Spain and Portugal. Handbook for Travellers, by Karl Baedeker. With 6 Maps and 46 Plans. Leipsic, Karl Baedeker; London: Dulau & Co. 1898. Size 6½ × 4½, pp. lxxxvi. and 618. *Price* 16*s*. *Presented by Messrs. Dulau & Co.*

This new guide will be welcome to tourists. It conforms in all respects to the well-known model of Baedeker's handbooks. It includes a historical sketch of Spanish art by Prof. C. Justi, the usual introductory matter, and sixty-six routes, covering the whole Iberian peninsula. The maps and plans are clear and numerous; that of the peninsula shows a number of interesting features not often dealt with in maps of the kind.

Spain—Cuenca. *B.S.G. Madrid* **39** (1897): 145–166. **Maria and Coello**

Caminos romanos de la provincia de Cuenca. Informes presentados á la Real Academia de la Historia. Por D. J. Santa Maria y D. Francisco Coello.

Spain—Historical. *Mém. Couronnés A.R. Belgique* **54** (1896): i.–xiv. and 1–52. **Gossart.**

Charles-Quint et Philippe II. Étude sur les origines de la prépondérance politique de l'Espagne en Europe. Par Ernest Gossart.

Spain—Majorca. **Martel.**

Sous terre (neuvième campagne, 1896) Cueva del Drach, á Majorque.—Scialets du Vercors. Chouruns du Dévoluy. Par M. E.-A. Martel. From 'Annuaire du Club Alpin Français,' 23e volume. 1896. Size 9 × 6, pp. 46. *Illustrations. Presented by the Author.*

The greater part of this paper is occupied with the description of the Cueva del Drach, in Majorca.

Sweden. *Deutsche Rundschau G.* **20** (1898): 198–205. **Hansen.**

Aus dem südlichen Schweden. Von Felix Hansen.

A tourist's impressions of Southern Sweden.

Sweden—Gothland. *K. Svensk. Vet.-A. Handlingar* **29** (1897): No. 1. **Johansson.**

Hufvuddragen af Gotlands växttopografi och växtgeografi grundade på en Kritisk behandling af dess Kärlväxtflora. Af K. Johansson. *With Map.* Pp. 1–270.

This article is accompanied by a floral map of Gothland on the scale of 1:300,000.

Sweden—Jemtland. *B. Geolog. I. University of Upsala* **3** (1896): 269–304. **Wiman.**

Kambrisch-silurische Faciesbildungen in Jemtland. Von Carl Wiman. *With Map and Plates.*

On the land-forms associated with the Cambrian and Silurian formation in Jemtland.

ASIA.

China. *Rev. Française* **23** (1898): 221–225, 277–283. **Montell.**
Le premier partage de la Chine. Par A. Montell. *With Sketch-Map.*
On the spheres of European influence in China.

China. *B.S.G. Com. Paris* **20** (1898): 10–27. **Brenier.**
Les voyages et les résultats de la mission lyonnaise d'exploration commerciale en Chine. Par M. Henri Brenier. *With Map.*

China. *B.S.G. Lyon* **14** (1898): 693–709. **Brenier.**
La situation commerciale des principales puissances en Chine, mission lyonnaise. Par Henri Brenier.

China. *Questions Dipl. et Colon.* **4** (1898): 6–12. **Madrolle.**
Questions Chinoises: Kouang-Tcheou, Sancian, Hai-Nan. Par Claudius Madrolle. *With Maps.*

China. *Ann. G.* **7** (1898): 177–180, 270–272. **Madrolle.**
La péninsule de Loui-Tcheou. Par M. Cl. Madrolle.

China. *J. R. United Service I.* **42** (1898): 406–437. **Colquhoun.**
The Chinese Question: how it may affect our Imperial Interests. By Archibald Colquhoun. *With Map.*

China—Port Arthur. *Questions Dipl. et Colon* **4** (1898): 98–102. ———
Une visite à Port-Arthur, après la conquête japonaise. Par Un Marin. *With Maps.*
Plan and views of Port Arthur and its batteries.

China—Shantung. *Naturw. Wochenschrift* **13** (1898): 141–145. **Richthofen.**
Der geologische Bau von Schantung (Kiau-tschou) mit besonderer Berücksichtigung der nutzbaren Lagerstätten Nach der Mittheilung des Geheimrath Prof. Dr. Ferdinand Frhr. v. Richthofen in der Zeitschrift für praktische Geologie (Berlin). *With Maps.*

China—Shantung. *Rev. Française* **23** (1898): 263–276. **Fauvel.**
La Province du Chantoung. Par A. A. Fauvel. *With Map.*

China—Sze-chwan. *B.S.G. Marseille* **21** (1897): 351–361. **Grosjean.**
Les Salines de Tze-Lieou-Tsin. Par M. A. Grosjean.
A description of the great field of brine-wells, which has accumulated a population of a million people in the town of Tze-liu-tsin.

China—Trade. *Petermanns M.* **44** (1898): 81–86. **Supan.**
Chinas Aussenhandel im Jahre 1896. Von A. Supan.

China—Turkestan, etc. **Roborovski.**
V. I. Roborovsky. The Expedition to Central Asia, 1893–1895. [In Russian.] Size 9½ × 6½, pp. 60. *Presented by the Author.*

China—Wei-hai-Wei. **Lagnérie.**
A travers le Monde, Tour du Monde **4** (1898): 113–116, 129–132.
Les Positions navales de la Mer Jaune, Taï-Lien-Wan et Port-Arthur, Weï-Haï-Weï. Par M. Villetard de Laguérie. *With Map and Illustrations.*

China—Yunnan. *Kew B.* (1897): 407–414. **Henry.**
A Budget from Yunnan. [By Dr. Henry.]
Letters from Yunnan "addressed to Kew," and giving a number of notes of places and people, as well as of the botany of the Chinese frontier.

Dutch East Indies. *B.S. d'Études colon.* **5** (1898): 25–78. **Plas.**
La Colonisation hollandaise aux Indes orientales. Par J. Plas. *With Illustrations.*

Eastern Asia. **Széchenyi.**
Wissenschaftliche Ergebnisse der Reise des Grafen Béla Széchenyi in Ostasien, 1877–1880. Zweiter Band. Die Bearbeitung des gesammelten Materials. Wien: E. Hölzel, 1898. Size 11½ × 9, pp. xiv. and 784. *Plates. Presented by the Author.*
This great volume, a translation of the Hungarian original published in 1896, contains an instalment of the discussion of the collections made by Count Béla Széchenyi in Eastern Asia. The memoirs treat of Tamil studies (linguistic), by Prof. Gabriel Bálint de Szentkatolna; the Nestorian monument in Singan-fu, by Father J. E. Heller, S.J., with two plates; and an account of the zoological and botanical collections by various specialists.

India. *J.S. Arts* **46** (1898): 569–583. **Sassoon.**

India and her Currency. By Sir Edward Sassoon, Bart.

India. *J.S. Arts* **46** (1898): 529–548. **Bell.**

Recent Railway Policy in India. By Horace Bell.

India—Assam. *J.S. Arts* **46** (1898): 473–495. **Luttman-Johnson.**

The Earthquake in Assam. By H. Luttman-Johnson.

On the Earthquake in 1897.

India—Burma. *China's Millions* **6** (1898): 28–29, 35–36, 50–51, 63–64 **Steven.**

The Kachins of the Chinese Borderland. By F. A. Steven. *With Illustrations.*

India—Ceylon. *P.I. Civil Engineers* **131** (1898): 272–288. **Waring.**

The Haputale and Bandarawela Extensions of the Ceylon Government Railway, with Notes upon other Railways recently constructed in the Colony. By F. J. Waring. *With* 11 *Cuts.*

India—Punjab. *J. Franklin I.* **145** (1898): 355–360. **Lyman.**

Some Illustrations of the Influence of Geological Structure on Topography. By Benjamin Smith Lyman. *With Maps.*

The examples cited belong to the very remarkable configuration of part of the Punjab Salt Range and the country north of it, which show the relation of geological structure to geographical form.

Japan.

Japan and the Japan Mission of the Church Missionary Society. Third Edition. London: Church Missionary Society, 1898. Size 7½ × 5¼, pp. viii. and 220. *Map and Illustrations. Price* 2*s. Presented by the Church Missionary Society.*

An excellent little history of missionary work in Japan, prefaced by a clear and concise account of the country, the people, and their native religions.

Mainly historical; one of the publications of the Portuguese Committee for celebrating the fourth Vasco da Gama centenary.

Japan. *Imp. and Asiatic Quarterly Rev.* **5** (1898): 309–320. **Morris.**

Japan—a Forecast. By J. Morris.

A discussion as to the direction which the future expansion of Japan is likely to follow.

Korea. **Villetard de Laguérie.**

Villetard de Laguérie. La Corée, Indépendante, Russe, ou Japonaise. Paris: Hachette et Cie., 1898. Size 7½ × 5, pp. viii. and 304. *Illustrations.*

The author was the special correspondent of the *Temps* during the Chino-Japanese war, and had opportunities for the personal study of Korea and its political affairs.

Malay Archipelago—Borneo. **Barth.**

Tijds. Ind. Taal- Land- en Volkenk. **39** (1897): 581–646.

De landschappen aan de Boven-Pinoh (Wester-afdeeling van Borneo). Door J. P. J. Barth.

Diary of a journey in the west of Borneo in 1894.

Malay Archipelago—Java. **Komoan.**

Tijds. Ind. Taal- Land- en Volkenk. **39** (1897): 516–519.

De vogelnestgrot "Rongkòb" in Djokjakarta. Door Komoan. *With Plate.*

Description of the Rongkob cave containing edible birds' nests in Jokjokarta.

Malay Archipelago—Philippine Islands. **Ericsson.**

Contemporary Rev. **73** (1898): 829–837.

A Visit to the Philippines. By Claes Ericsson.

The visit took place in 1894.

Malay Archipelago—Sumatra. *Verh. Ges. Erdk. Berlin* **25** (1898): 177–189. **Maass.**

Herr Alfred Maass: Ueber seine Reise nach den Mentawei-Inseln.

Malay Archipelago—Sumatra. *B.S.G. Italiana* **11** (1898): 256–299. **Modigliani.**

Materiale per lo studio dell' isola Sipòra (Mentawèi). Nota del dott. E. Modigliani. *With Illustrations.*

Malay Archipelago—Sumatra. *Naturwiss. Wochenschrift* **13** (1898): 225–229. **Fürst.**

Die Bataker. Von Dr. E. Fürst.

On the Batak people and their customs.

Malay Peninsula. **Boulenger and Wray.**
Perak Museum Notes. Vol. ii., part i. On the occurrence of Schlegel's Gavial (*Tomistoma schlegeli*) in the Malay Peninsular [*sic*]. By G. A. Boulenger, F.R.S. Together with papers on the Cave-Dwellers of Perak—Tin-Mining in Perak, Chapter iv.—Teeth blacking amongst the Malays—Gutta Cultivation—Exposed Foundations at Perak Museum—The "Rice Sapper" Beetle Pest on Gapis Estate—Report on Perak Museum. By L. Wray, jun. Taiping, 1897. Size 10 × 6½, pp. 80. *Presented by the Perak Museum.*

Malay Peninsula—Selangor. **Rodger.**
Annual Report of the State of Selangor for the Year 1896. By J. P. Rodger. Kuala Lumpur, 1897. Size 13½ × 8½, pp. 42.

Persia. **Sykes.**
Through Persia on a Side-Saddle. By Ella C. Sykes. London: A. D. Innes & Co., 1898. Size 9½ × 6, pp. 362. *Portrait, Map, and Illustrations. Price* 16*s. Presented by the Author.*

A separate notice will be given of this book.

Russia—Altai Mountains. *Iz. Imp. Russian G.S.* **33** (1897): 356–360. **Sapozhnikoff.**
Glaciers of the Altai Mountains. By V. V. Sapozhnikoff. [In Russian.]

Russia—Caucasus. *Mém. Caucasian Sect. Imp. Russian G.S.* **19** (1897): 161–168. ——
Historical Sketch of the Cossack army and the cities of the Province Terskaya, N. Caucasus. [In Russian.]

Russia—Caucasus. *Rev. G.* **42** (1898): 180–198, 241–265, 321–344. **Baye.**
En Géorgie. Par Baron de Baye. *With Illustrations.*

Russia—Caucasus. *Globus* **73** (1898): 281–288. **Greim.**
Ein Ausflug zum Zei-Gletscher in der Centralkette des Kaukasus. Von Dr. G. Greim. *With Illustrations.*

Russia—Caucasus. *Mém. Caucasian Sect. Imp. Russian G.S.* **19** (1897): 115–160. ——
Statistics of Terskaya Province, N. Caucasus, 1894. [In Russian.]

Russia—Siberia. **Simpson.**
Side Lights on Siberia. Some Account of the Great Siberian Railroad, the Prisons, and Exile System. By James Young Simpson. Edinburgh and London: W. Blackwood & Sons, 1898. Size 8½ × 6, pp. xvi. and 384. *Map and Illustrations. Price* 16*s. Presented by the Publishers.*

A valuable record of a recent journey across Siberia. A sketch of the land and the people is followed by an account of the Great Siberian railway, and a narrative of travel on the old post-road to Irkutsk. Then a connected description of the exile system is given, with impressions of the prisons and penal conditions considered in an impartial manner. Special details are given of Alexandrovski Central, and the silver mines of Nerchinsk. A chapter is devoted to Sakhalin, which, however, the author did not visit. In conclusion, there are opinions on the future of Siberia, the prosperity of which is held to depend entirely on the new railway.

AFRICA.

Abyssinia. ——
Treaty Series. No. 2. 1898. Treaty between Great Britain and Ethiopia. Signed by the Emperor Menelek II., and by Her Majesty's Envoy, at Adis Abbaba, May 14, 1897. Ratified by the Queen, July 28, 1897. London: Eyre & Spottiswoode. Size 10 × 6½, pp. 10. *Price* 1*d.*

British Central Africa. **Sharpe.**
Africa. No. 5 (1897). Report by Consul and Acting Commissioner Sharpe on the Trade and General Condition of the British Central Africa Protectorate, from April 1, 1896, to March 31, 1897. London: Eyre & Spottiswoode, 1897. Size 13½ × 8½, pp. 14. *Price* 2*d.*

British South Africa. ——
The British South Africa Company. Report on the Company's proceedings and the condition of the Territories within the sphere of its operations, 1896–1897. Printed for the information of Shareholders at the 5th General Meeting, April, 1898. Size 10½ × 8½, pp. 172. *Maps and Plans.*

Report of the present position of the British South Africa Company's territory, with maps showing the railway and telegraph lines, and plans of Bulawayo, Salisbury, and other townships.

British South Africa—Mashonaland. **Alderson.**

With the Mounted Infantry and the Mashonaland Field Force, 1896. By Brevet-Lieut.-Colonel E. A. H. Alderson. London: Methuen & Co., 1898. Size 9½ × 6, pp. xvi. and 308. *Maps and Illustrations. Price* 10*s.* 6*d. Presented by the Publishers.*

Colonel Alderson gives a clear and spirited account of the expedition of regular troops to the relief of Salisbury, including the crossing of Portuguese territory from Beira, and the whole series of operations against the revolted Mashonas. By means of numerous diagrams and a remarkable power of untechnical description, he makes the reader see exactly what problem was suggested to the commanding officer at each point, and how each difficulty was overcome. The description of the geographical conditions from a military point of view is valuable.

German East Africa—Uhehe *Deutsche Kolonialzeitung* **11** (1898): 97–99. **Arning.**

Die Zukunft von Uhehe. Von Wilhelm Arning. *With Maps.*

German West Africa—Togo. *Deutsches Kolonialblatt* **9** (1898): 204–208. **Victor.**

Togo: Schilderung einer Reise nach Atakpame.

Notes of the journey of a German trader from Little Popo to Atakpame in 1897. The author points out that the trade of the district takes the more direct route to the nearer seaport of Great Popo, in Dahomey.

Lake Tanganyika. *P.R.S.* **62** (1898): 451–458. **Moore.**

On the Zoological Evidence for the Connection of Lake Tanganyika with the Sea. By J. E. S. Moore.

This will be specially noticed.

Morocco. *Questions Diplomat. et Colon.* **2** (1897): 543–546. **Attanoux.**

Au Maroc. Les pirates du Riff. Par M. J. Bernard d'Attanoux.

On the Riff pirates and their country.

Morocco. *Questions Diplomat. et Colon.* **1** (1897): 472–476. **Couronnel.**

Notes sur le Maroc. Par M. le Comte de Couronnel.

An examination of the constitution of the empire of Morocco, and the real position and power of the emperor.

Morocco. *Questions Diplomat. et Colon.* **1** (1897): 321–334. **Mandeville.**

La frontière marocaine et Figuig. Par M. Mandeville. *With Illustration.*

With a view of the town of Figuig.

Morocco. *Questions Diplomat. et Colon.* **1** (1897): 220–224. **Mandeville.**

Les troubles à la frontière marocaine. Par M. Mandeville. *With Map and Plans.*

The map is of the Algeria-Morocco frontier, and the plans of the fortified town of Ujda.

Morocco—Agurai. *Blackwood's Mag.* **163** (1898): 488–497. **Harris.**

The Town of the Renegades: Agurai. By Walter B. Harris.

Describes the first visit of a European to the little-known town of Agurai, in the neighbourhood of Mequinez.

Morocco—Fez. *Globus* **73** (1898): 233–238, 259–263. **Pfeil.**

Eine Reise nach Fez. Von Joachim, Graf v. Pfeil. *With Portraits.*

An interesting narrative of the recent visit paid by Count and Countess Pfeil to Fez.

North Africa. **Bernard.**

Augustin Bernard. Hautes-Plaines et Steppes de la Berbérie. Extrait du Bulletin de la Société de Géographie d'Oran. Oran: Imp. Fouque, 1898. Size 9½ × 6½, pp. 16. *Presented by the Author.*

An investigation into the character of the high plains and steppes of Northern Africa, with the object of introducing clearer definitions of the terms, and a distinction between surface features due to relief and those produced by climate or vegetation.

West Africa. **Harford-Battersby.**

Niger and Yoruba Notes. A Record of Work in Western Equatorial Africa. Edited by C. F. Harford-Battersby, M.D. Vol. iii. London: Marshall Brothers, 1897. Size 10 × 7½, pp. iv. and 96. *Portrait. Presented by Dr. Harford-Battersby.*

This missionary magazine contains many practical notes on some parts of West Africa which are little visited, especially in the Niger delta and its Hinterland.

West Africa—Borgu. *B.S.G. Lyon* **14** (1898): 725–729. **Ned-Noll.**
La Mission du capitaine Vermeersch au Borgou. Par Ned-Noll.

West Africa—Fernando Po. *B.S.G. Madrid* **1** (1897): 139–143. ———
Guinea española. Colonizacion en Fernando Póo.

West Africa—Lower Senegal. *C. Rd.* **126** (1898): 666–669. **Meunier.**
Contribution à la géologie du bas Sénégal. Note de M. Stanislas Meunier.

Recent exploitation of the phosphate deposits of the lower Senegal have revealed many new facts as to the geological structure of the country about the mouth of the Senegal.

West Africa—Niger. *B.S.G. Lyon* **14** (1898): 710–725. **Voulet and Chanoine.**
Dans la boucle du Niger. Par MM. le Capitaine Voulet et le Lieutenant Chanoine. *With Map.*

West Africa—Niger. *Fortnightly Rev.* **63** (1898): 576–591. **Edwards.**
The French on the Niger. The "Open Door" in West Africa. By F. A. Edwards. *With Map.*

The note on the Royal Geographical Society's system of geographical orthography attached to this careful article is not quite correct. *Timbuktu*, in accordance with that system, = *Teembocktoo*, and *Kenedugu* = *Kay-nay-doogoo*. The pronunciation *Kenny-doogoo* would require to be spelled *Kennedugu*.

West Africa—Niger. **Hourst.**
Sur le Niger et au Pays des Touaregs. La Mission Hourst par le Lieutenant de vaisseau Hourst. Paris: E. Plon, Nourrit et C^ie^, 1898. Size 9 × 6, pp. xii. and 482. *Portrait, Map, and Illustrations.*

This will be noticed along with other books on Africa.

West Africa—Niger Bend. *Questions Diplomat. et Colon.* **1** (1897): 457–462. **Vuillot.**
Du Dahomey au Niger. L'occupation de Boussa. Par M. Paul Vuillot. *With Map.*

West Africa—Niger Sources. **Trotter.**
The Niger Sources and the Borders of the New Sierra Leone Protectorate. By Lieut.-Colonel J. K. Trotter. London: Methuen & Co., 1898. Size 8 × 5¼, pp. 238. *Map and Illustrations. Price 5s. Presented by the Publishers.*

This will be referred to along with other books on Africa.

West Africa—Senegal. *B.S.G. Lyon* **14** (1898): 730–750. **Mille.**
La vie commerciale et politique au Sénégal. Par M. Pierre Mille.

West Africa—Togo-Dahomey. *B.S.G. Lyon* **14** (1897): 644–647. ———
La convention de Togo-Dahomey. *With Map.*

West Central Africa. **Edwards.**
From the Kongo to the Niger. By F. A. Edwards. From the *Gentleman's Magazine*, March, 1898, pp. 299–307. *Map.* London: Chatto & Windus. Size 9 × 6. *Presented by the Author.*

A popular account of Maistre's well-known journey.

Western Sahara. *B.S.G. Madrid* **1** (1897): 137–139. ———
Sáhara español. La factoria de Rio de Oro.

NORTH AMERICA.

Alaska. **Rodman.**
Compilation of the most recent information relative to the harbors, anchorages, and dangers to navigation in the vicinity of Chatham and Peril Straits and Cook's Inlet, Alaska. Arranged and Compiled by Lieut. Hugh Rodman.—Report of the Superintendent of the U.S. Coast and Geodetic Survey, showing the progress of the work during the Fiscal Year ending with June, 1896. Pp. 373–393. Washington, 1897. Size 12 × 9¼.

These notes give the result of surveys made in 1895; they are preliminary in their character to a complete survey of the coasts, which is now much wanted in order to provide trustworthy charts.

Alaska. *National G. Mag.* **9** (1898): 178–187. **Evans.**
Some of the Conditions and Possibilities of Agriculture in Alaska. By Dr. Walter H. Evans.

A careful consideration of the soils, the natural vegetation, and the experiments in raising crops and vegetables in the settled parts of Alaska leads to the conclusion that

that territory is by no means so devoid of agricultural possibilities as has usually been supposed.

Alaska. *National G. Mag.* **9** (1898): 139–172. **Emmons.**

Alaska and its Mineral Resources. By Samuel Franklin Emmons. *With Illustrations.*

An abstract of a paper prepared for the U.S. Geological Survey for the use of travellers and prospectors. It gives an excellent summary of the geographical conditions of the vast territory.

Alaska. *National G. Mag.* **9** (1898): 172–178. **Perkins.**

The Civil Government of Alaska. By Hon. George C. Perkins.

The method of administration of the United States Territory of Alaska in force pending the passing of a bill now before Congress is here described.

Alaska. *B. American G.S.* **30** (1898): 127–134. **Hayes.**

Copper River as a route to the Yukon Basin. By C. Willard Hayes. *With Maps.*

Alaska. *B.S.R.G. d'Anvers* **22** (1898): 13–34. **Richet.**

L'Alaska. Conférence donnée le 25 mars 1898. Par M. Étienne Richet. *With Map.*

Alaska—Climate. *National G. Mag.* **9** (1898): 132–137. **Greely.**

Climatic Conditions of Alaska. By General A. W. Greely.

General Greely recalls the time when the public protested against the waste of public money in attempting to acquire any knowledge of the climatic conditions of so useless a region as Alaska, and proceeds to try to satisfy the present imperative demand of the public for trustworthy information on this point by recording such scanty observations as are available.

United States—Mississippi River. *National G. Mag.* **8** (1897): 351–354. **Corthell.**

The Delta of the Mississippi river. By E. L. Corthell, D.SC., etc.

A paper read to Section E of the British Association at Toronto in 1897.

United States—Mississippi Valley. *J. Geology* **5** (1897): 795–802. **Chamberlin.**

Supplementary Hypothesis respecting the Origin of the Loess of the Mississippi Valley. By T. C. Chamberlin.

The paper concludes, "The Richthofen loess may be said to be first eolian and secondarily aqueous; the Mississippian loess, first aqueous and secondarily eolian. The Richthofen loess in its ultimate origin is residuary; the Mississipian loess in its ultimate origin is glacial."

United States—Montana. **Weed and Pirsson.**

Department of the Interior, Bulletin of the United States Geological Survey. No. 139. Geology of the Castle Mountain Mining District, Montana. By Walter H. Weed and L. V. Pirsson. Washington, 1896. Size 9½ × 6, pp. 164. *Maps and Illustrations. Presented by the Survey.*

United States—New Mexico. **Barker.**

Department of the Interior, United States Geological Survey. Water-Supply and Irrigation Papers of the United States Geological Survey. No. 10. Irrigation in Mesilla Valley, New Mexico. By F. C. Barker. Washington, 1898. Size 9½ × 6, pp. 50. *Map and Plates.*

United States—New Mexico—Indians. **Hodge.**

The Verification of a Tradition. By Frederick Webb Hodge. [From the *American Anthropologist* for September, 1897.] Washington, 1897. Size 9½ × 6½, pp. [4].

Refers to a legend of the Acoma Indians of New Mexico relating to the Mesa Encantada, and a visit paid to that site by the author.

United States—New York. *Globus* **73** (1898): 12–15. **Steffens.**

Gross-New-York. Von Dr. C. Steffens. *With Plan and Illustrations.*

United States—New York State. *B. American G.S.* **30** (1898): 28–56. **Tarr.**

The Physical Geography of New York State. By Ralph S. Tarr. Part iii. Plains and Plateaux. *With Illustrations.*

United States—Oregon. **Diller.**

A Geological Reconnaissance in North-Western Oregon. By J. T. Diller.—Seventeenth Annual Report of the United States Geological Survey . . . 1895–96. Part i. Pp. 447–520. *Map and Illustrations.* Washington, 1896. Size 12 × 8.

CENTRAL AND SOUTH AMERICA.

Argentine Republic—Boundaries. **Delachaux.**
Limites occidentales de la República Argentina. El articulo del Dr. Juan Steffen: La Cuestion de Limite Chileno-Argentina con especial consideracion de la Patagonia. Exámen critico por Enrique S. Delachaux. (Revista del Museo de La Plata. Del Tomo IX., pàg. 1 y siguientes.) La Plata, 1898. Size 11½ × 7½, pp. 78. *Presented by the Museo de La Plata.*

Argentine Republic—Mendoza. *B.A. Nac. Ci. Cordoba* **15** (1897): 425–486. **Bodenbender.**
El suelo y las vertientes de la ciudad de Mendoza y sus alrededores. Por el Doctor Guillermo Bodenbender.

On the geology of the city of Mendoza and its water-supply.

Argentine Republic—Mendoza. *B.A. Nac. Ci. Cordoba* **15** (1897): 487–501. **Doering.**
Observaciones hipsométricas alrededor de Mendoza, practicadas por el doctor Bodenbender y calculadas por el doctor Oscar Doering.

Bolivia—Boundary. **Ballivián.**
Sociedad Geográfica de La Paz, Bolivia. Demarcacion de Limites con los Estados Unidos del Brasil. Documentos compilados y traducidos por Manuel V. Ballivián. La Paz, 1897. Size 8½ × 6, pp. viii. and 108. *Maps. Presented by the Author.*

Brazil—Marajo Island. *Globus* **73** (1898): 90–93, 107–110. **Katzer.**
Eine Forschungsreise nach der Insel Marajó (Amazonas-Mündung). Von Dr. Friedrich Katzer.

The narrative of an exploring journey through the great island of Marajo, at the mouth of the Amazon.

British Guiana. **Kirke.**
Twenty-five Years in British Guiana. By Henry Kirke. London: Low and Co., 1898. Size 9 × 6, pp. x. and 364. *Portrait, Map, and Illustrations. Price* 10*s.* 6*d. Presented by the Publishers.*

A volume of reminiscences of the most interesting kind, picturing social life in all classes of the composite population of British Guiana. Historical facts bearing on the development of the colony are referred to, and the descriptions of journeys in the interior give some information as to the life of the aborigines. An excellent map illustrates the still unsettled question of the Venezuela frontier.

AUSTRALASIA AND PACIFIC ISLANDS.

Australasia Bibliography. **[Petherick.]**
Catalogue of Books relating to Australasia, Malaysia, Polynesia, the Pacific Coast of America, and the South Seas. Offered for sale by Francis Edwards, Bookseller, 83, High Street, Marylebone, London, W. Part I. (A–C), April, 1898. Size 8½ × 5½, pp. 48. *Presented by the Publisher.*

This is the commencement of a catalogue compiled by Mr. E. A. Petherick, of an exceptionally large collection of books bearing on Australasia and the Pacific.

Australia. **Lespagnol.**
Sur le Caractère Désertique de l'Australie intérieure. Par G. Lespagnol. (Extrait des *Annales de Géographie.*) (Nos. 31, 32 et 33, du 15 Janvier, du 15 Mars et du 15 Mai 1898.) Paris: A. Colin & Cie. Size 10 × 6½, pp. [58]. *Maps. Presented by the Author.*

Treats of the surface, the climate, and the hydrographic forms of the desert region of Australia.

Bismarck Archipelago. *Z. Ges. Erdk. Berlin* **32** (1897): 349–359. **Schleinitz.**
Begleitworte zur Karte des östlichen Teils der Insel Neu-Pommern. Von Frhr. von Schleinitz. *With Map.*

This paper, on the eastern part of New Britain, is referred to in the Monthly Record. The map is on the scale of 1:500,000.

British Solomon Islands. *Kew B.* (1897): 416–420. ——
British Solomon Islands.

Extracts from the colonial reports on the vegetable resources of the Solomon islands.

Clipperton Atoll. *Quarterly J. Geol. S.* **54** (1898): 228–229. **Wharton.**
Note on Clipperton Atoll (Northern Pacific). By Rear-Admiral Sir William J. Wharton, K.C.B., F.R.S. *With Map and Plates.*

This is summarized in the *Journal* for June, vol. xi. p. 671.

Hawaii. *Ann. G.* 7 (1898): 278–281. **Bellet.**

Les îles Hawaï. Par M. D. Bellet.

Hawaii. *Questions Diplomat. et Colon.* 1 (1897): 588–594. **Servant.**

Havaï: Étude géographique et historique. Par Stéphane Servant.

A study in political geography.

Historical—Mendana. *B.S.G. Paris* 19 (1898): 59–88. **Marcel.**

Mendaña et la découverte des îles Marquises. Par M. Gabriel Marcel. *With Map.*

New Guinea. **Forbes and Thomson.**

Sir William Macgregor's Journey across New Guinea: Correspondence. H. O. Forbes and J. P. Thomson. Brisbane, 1897. Size 9 × 5½, pp. 8. *Presented by Mr. J. P. Thomson.*

New Guinea. **Macgregor.**

Despatch from His Excellency the Lieutenant-Governor of British New Guinea, reporting visit inland to the Western end of the Owen Stanley Range, and thence across the Island to the North and East Coast. [No. 5.] Brisbane, January 26, 1898. Size 13½ × 8½, pp. 20. *Presented by the Colonial Office.*

The full report of Sir William Macgregor's crossing of New Guinea.

New Zealand. **Broderick.**

Reconnaissance Survey of a Road from Tekapo to Mount Cook. By T. N. Broderick. Wellington, 1897. Size 13½ × 8½, pp. 2. *Map. Price* 6*d. Presented by the Colonial Office.*

POLAR REGIONS.

Antarctic. **Brunner.**

Antarktis. Wege und Ziele der Forschung in der Südpolarregion. Von Heinrich Brunner. Zurich, [1898]. Size 7½ × 5, pp. 24. *Presented by the Author.*

Antarctic. *Petermanns M.* 44 (1898): 66–69. **Supan.**

Die antarktische Forschung. Von Prof. Dr. A. Supan.

Summarizing all the plans for south polar research now before the public, and pointing out the importance of seizing the opportunity of the present favourable climatic conditions.

Arctic—Frobisher Bay. **Porter.**

Frobisher Bay Revisited. By Russell W. Porter. From Bulletin of the American Geographical Society, vol. xxx., 1898, No. 2. Size 10 × 6½, pp. 97–110. *Chart and Illustrations. Presented by the Author.*

Frobisher bay, supposed by the discoverer in 1576 to be the North-West Passage, was first explored to its head by Hall in 1860, but no explorations had been carried out in it since, until the boat expedition under Mr. Porter investigated its whole length (about 150 miles) in 1897.

Arctic—Spitsbergen. *Ymer* (1898): 17–23. **Norselius.**

Special öfver Danskgattet. Af Gustaf Norselius. *With Chart and Illustration.*

The surveys were carried out at Danes island when the Andrée balloon expedition was preparing to start.

Franz Josef Land. **Clarke and Bruce.**

On the Avifauna of Franz Josef Land. By Wm. Eagle Clarke. With Notes by Wm. S. Bruce. (From the *Ibis* for April, 1898.) Size 9 × 6, pp. [30]. *Map. Presented by W. S. Bruce, Esq.*

Greenland. **Astrup.**

With Peary near the Pole. By Eivind Astrup. Translated from the Norwegian by H. J. Bull. London: C. Arthur Pearson, 1898. Size 9 × 6, pp. 362. *Portrait, Map, and Illustrations. Price* 10*s.* 6*d. Presented by the Publisher.*

The late Mr. Eivind Astrup, the fact of whose death is not referred to in the preface or elsewhere in the volume, wrote a series of articles for a Norwegian newspaper descriptive of the two expeditions of Mr. Peary to North Greenland, in which he took part, in 1892 and 1893–94. These he subsequently brought together in book form, and the volume is now translated in a very readable manner. A description of the incidents of the journey is followed by some particulars of the Eskimo of the region and their mode of life.

MATHEMATICAL GEOGRAPHY.

Cartography. *Petermanns M.* **44** (1898): 64–66. **Hammer.**
Noch ein Wort zur "Terraindarstellung mit schiefer Beleuchtung." Von Prof. Dr. E. Hammer.

On a method of hill-shading.

Eclipse Calculations.
Nautical Almanac Circular, No. 17. Local particulars of the Total Eclipse of the Sun, 1900, May 27–28. Nautical Almanac Office, 1898. Size 10 × 6½, pp. 12. *Maps. Presented by the Director of the Nautical Almanac.*

Geodesy. **Kummell.**
A new solution of a principal Geodetic Problem. By Chas. H. Kummell.—Report of the Superintendent of the U.S. Coast and Geodetic Survey, showing the progress of the work during the Fiscal year ending with June, 1896. Pp. 293–303. Washington, 1897. Size 12 × 9½.

A solution of the inverse problem of the determination of the shortest distance between two points on a spheroid.

Geodesy. *Sitz. A. W. München* (1898): 19–36. **Franke.**
Koordinaten-Transformationen in geodätischen Dreiecknetzen. Von J. H. Franke.

On Soldner's co-ordinates, *i.e.* the rectangular spherical co-ordinates introduced by Soldner in calculating the triangulation of Bavaria in the early part of the present century.

Mathematical. **Putnam.**
Field method of reducing portable transit time observations. By G. R. Putnam.—Report of the Superintendent of the U.S. Coast and Geodetic Survey, showing the progress of the work during the Fiscal year ending with June, 1896. Pp. 347–352. Washington, 1897. Size 12 × 9½.

Navigation. *Nature* **58** (1898): 104–107. **Ruthven.**
Navigation. By Captain J. F. Ruthven. *With Diagrams.*

On methods of laying out great-circle courses.

Position off coasts. *Rev. Maritime* **136** (1898): 461–501. **Jaffré.**
Courant et position exacte d'un navire lorsque, étant en vue d'une côte, on n'en peut relever qu'un seul point. Par M. Paul Jaffré.

Time. *P. and T.R.S. Canada* **2** (1896), (Sect. iii.): 83–90. **Lumsden.**
The Unification of Civil, Nautical, and Astronomical Time. By G. E. Lumsden.

Time. *B.S.G. Paris* **19** (1898): 89–108. **Sarrauton.**
Exposé du systéme de l'heure décimale. Par Henri de Sarrauton. *With Map.*

PHYSICAL AND BIOLOGICAL GEOGRAPHY.

Biological Geography. *Ann. G.* **7** (1898): 193–200. **Costantin.**
Essai de biologie géographique sur la végétation tropicale. Par J. Costantin.

Calling attention to the importance of geographical environment in the evolution of plants.

Cultivated Plants. **Hahn.**
Wie setzt sich der Bestand der Kulturpflanzen zusammen, von Dr. Hahn.—Separat-Abdruck aus dem Correspondenz-Blatt der deutschen anthropologischen Gesellschaft. Nr. 11. u. 12. 1897. (Bericht der XXVIII. allgemeinen Versammlung in Lübeck.) Size 11 × 9, pp. [8]. *Presented by the Author.*

Geyser Eruption. *American J. Sci.* **5** (1898): 323–333. **Jaggar.**
Some Conditions affecting Geyser Eruption. By T. A. Jaggar, junr.

On experiments tending to elucidate geyser actions.

Meteorology. *T.R.S. Edinburgh* **38** (1896): 579–606. **Gillespie.**
The Weather, Influenza, and Disease: from the Records of the Edinburgh Royal Infirmary for fifty years. By A. Lockhart Gillespie, M.D. *With Diagrams.*

Meteorology. *C. Rd.* **126** (1898): 1173–1176. **Garrigou-Lagrange.**
De l'influence des mouvements de la Lune sur les oscillations de l' atmosphère. Note de M. P. Garrigou-Lagrange.

The author believes that he has found evidence of lunar influence on atmospheric pressure; but the atmospheric tides occur only once daily, not twice as in the case of oceanic tides.

Meteorology. *K. Svensk, Vet.-A. Handlingar* **29** (1897): No. 3. **Hildebrandsson.**
Quelques recherches sur les centres d'action de l'atmosphère. Par H. Hildebrand Hildebrandsson. *With Diagrams.* Pp. 1–36.

A note on this important paper will be given.

Meteorology—Forest Climate. *Meteorolog. Z.* **15** (1898): 134–140. **Schubert.**
Temperatur und Feuchtigkeit der Luft auf freiem Felde, im Kiefern und Buchenbestande. Von J. Schubert.

The average of afternoon observations in the summer months (June to August) showed that the shade temperature in a thick pine wood was 0·5° Fahr. lower and the relative humidity 1 per cent. higher than in the open field, while under the trees of a beech wood the temperature averaged 2° Fahr. lower and the relative humidity 6 per cent. higher than in the open.

ANTHROPOGEOGRAPHY AND HISTORICAL GEOGRAPHY.

Anthropology. **Hahn.**
Demeter und Baubo. Versuch einer Theorie der Entstehung unsres Ackerbaus. Von Ed. Hahn, Berlin. Lübeck: Max Schmidt [not dated]. Size 9 × 6, pp. 78. *Presented by the Author.*

This treats mainly of mythological and anthropological matters, related to agriculture through early beliefs and customs.

Anthropology. *Rev. Scientifique* **9** (1898): 513–516. **Lombroso.**
Les races et le milieu ambiant. Par M. C. Lombroso.

A discussion showing that certain environments tend to produce and perpetuate distinctive types of man. The author shows how the Jewish race varies physically in different countries, although racially pure in all, while people of entirely different races have kept up the characteristics of Turks, Greeks, Frenchmen, etc., for century after century in the respective countries.

Bishop Martyr's European Journey. *B.S.G. Madrid* **39** (1897), (Suppl.): 1–20. ———
Relación de un viaje por Europa con la peregrinación á Santiago de Galicia verificado á fines del siglo xv. por Mártir, Obispo de Arzenyan.

On the journey to Santiago de Galicia of Martyr, Bishop of Arzenjan in Armenia, at the end of the fifteenth century.

Commercial Geography. *J.R. United Service I.* **42** (1898): 365–405. **Ballard.**
The Protection of Commerce during War. By Commander G. A. Ballard.

Commercial Geography—Rice. *Naturw. Wochenschrift* **13** (1898): 132–138. **Fürst.**
Die Cultur des Reises und der auf Reisfeldern erzielten zweiten Gewächse.

Early Prussian Colonies. **Didier.**
Rev. G. **41** (1897): 357–365, 414–424; **42** (1898): 14–21.
Entreprises coloniales de la Prusse au XVII^e^ siècle. Par L. Didier.

On the temporary Prussian possessions in the West Indies and Africa, most of them conquests from the Danes and the Dutch.

BIOGRAPHY.

Button. **Christy.**
Admiral Sir Thomas Button, Kt., of Cardiff. By Miller Christy. (Reprinted from the *Transactions* of the Cardiff Naturalists' Society, vol. xxix. part 1, 1896–97). Size 9 × 6, pp. 10. *Presented by the Author.*

Foullon-Norbeeck. *Deutsche Rundschau G.* **20** (1898): 376–377. ———
Heinrich Freiherr v. Foullon-Norbeeck. *With Portrait.*

The subject of this notice was born in Austria in 1850, and, after considerable travels as a geologist in Australasia, was killed by a native in the Solomon Islands on February 27, 1896, while in the act of entering an aneroid-reading in his notebook.

Gilbert. *P. & T.R.S. Canada* **2** (1896), (sect. ii.): 33–39. **Brymner.**
Death of Sir Humphrey Gilbert. By Douglas Brymner, LL.D.

Narrative of the last voyage of Sir Humphrey Gilbert in 1583.

Italian Geographers. **Vedova.**
G. Dalla Vedova. I recenti Lutti della Società Geografica Italiana. Roma, 1898. Size 9¼ × 6, pp. 32. *Map and Portraits. Presented by the Author.*

Biographical notices, with portraits, of the late Vittorio Arminjon, who commanded the *Magenta*, the first Italian war-vessel to circumnavigate the world; Admiral Carlo

Alberto Racchia; Cristofero Negri, late president of the Italian Geographical Society; Giuseppe Arimondi; Antonio Cecchi; Vittorio Bòttego and Maurizio Secchi, of whose journeys in Somaliland a map is given.

Marcou. *American J. Sci.* **5** (1898): 398. ——

Prof. Jules Marcou.

Rosignoli. *B.S. Khédiv. G.* **4** (1897): 875–897. **Bonola.**

Don Paolo Rosignoli. Par Dr. F. Bonola bey. *With Portrait.*

Father Rosignoli was one of the prisoners of the Mahdi who succeeded in escaping from the Sudan.

Supan. *Deutsche Rundschau G.* **20** (1898): 374–376. ——

Alexander Supan. *With Portrait.*

Toscanelli. *B.S.G. Italiana* **11** (1898): 246–256. **Baratta.**

Paolo Dal Pozzo Toscanelli iniziatore della scoperta dell' America. Notizie del socio Mario Baratta. *With Portrait and Plate.*

Wauters. *Mouvement G.* **15** (1898): 235–237. **Wauters.**

Alphonse Wauters. Par A. J. Wauters. *With Portrait.*

GENERAL.

Bibliography. ——

International Catalogue of Scientific Literature. Report of the Committee of the Royal Society of London, with Schedules of Classification. March 30, 1898. Size 8½ × 5½. *Presented by the Royal Society.*

British Empire. *J.S. Arts* **46** (1898): 497–511. **Lowles.**

The British Empire: its Resources and its Future. By John Lowles, M.P.

Dwells on the history of the acquisition and on the magnitude of the British Empire. The statement is made, without reference to authorities, that the British Empire "embraces four continents, 10,000 islands, 500 promontories, and 2000 rivers."

British Empire. *G.Z.* **4** (1898): 211–224. **Ratzel.**

Politisch-geographische Rückblicke. Von Friedrich Ratzel. 2. Das englische Weltreich.

A critical study of the relations between the British colonies and the mother-country.

Classification of Geography. ——

Concilium Bibliographicum. Zürich-Oberstrass. 1 April 1898. Conspectus Methodicus. Size 9 × 6, pp. 16. *Presented by the Concilium Bibliographicum.*

This contains a subdivision of the Earth's surface for bibliographical purposes, commencing with oceans and continents, and carried down as far as French departments and British counties.

Colonies of Spain and Portugal. **Zimmermann.**

Die Europäischen Kolonien. Erster Band. Die Kolonialpolitik Portugals und Spaniens in ihrer Entwickelung von den Anfängen bis zur Gegenwart dargestellt von Dr. Alfred Zimmermann. Berlin: E. S. Mittler und Sohn, 1896. Size 9½ × 6, pp. xvi. and 516. *Map.*

An important study of historical geography, tracing the rise and decline of the colonial empires of Portugal and Spain.

Commercial Geography—Railways. **Radtsig.**

Influence of Railways on Agriculture, Industry, and Trade. Anton Radtsig. [In Russian.] St. Petersburg, 1896. Size 10 × 7, pp. 268. *Diagrams. Presented by the Author.*

This volume deals with the railways of the world in general, comparing different countries, and then in detail with the railways of Russia, and the economic results of their increasing length. There are numerous statistical diagrams.

Cosmogony. **Skwortzow.**

Soleil, terre et électricité. (Un chapitre de la théorie nouvelle de l'univers.) Par le prof. Jr. Skwortzow. Kharkow, 1898. Size 10½ × 7, pp. 8. *Presented by the Author.*

Decimal Division of Angles. **Carrière.**

Société d'Étude des Sciences naturelles de Béziers. Extrait du Bulletin Mensuel, No. 2, Février 1898. Rapport sur l'application du Système Décimal à la Mesure du

Temps and de la Circonférence. Par M. L. Carrière. Béziers: H. Azais, 1898. Size 10½ × 6½, pp. [12]. *Presented by the Author.*

Education—Methods. *Mouvement G.* **15** (1898): 156–158, 168–170. **Renard.**

L'enseignement de la Géographie. Par A. F. Renard.

Education—Methods. *Mouvement G.* **15** (1898): 118–122. **Renard.**

La Géographie à l'Université de Vienne. Par A. F. Renard.

An account of Prof. Penck's methods of geographical teaching in Vienna.

Educational Methods. *G.Z.* **4** (1898): 274–287. **Krug.**

Amerikanische Lehrbücher für den Geographie-Unterricht. Von M. Krug.

On American school books on geography.

French Colonization. *Questions Dipl. et Colon* **4** (1898): 22–34. **Halot.**

L'aptitude des Français à coloniser, démontrée par les résultats obtenus dans leurs dernières Colonies. Par Alexandre Halot.

General. **Cust.**

Linguistic and Oriental Essays. Written from the year 1840 to 1897. Fifth Series. By Robert Needham Cust, LL.D. 2 vols. London: Luzac & Co., 1898. Size 8½ × 6, pp. xiv. and 1076. *Portrait. Presented by the Author.*

A collection of essays and newspaper articles extending over a considerable period and touching on many topics. Several are devoted to studies of native life in India, a large number to subjects related to historical geography, and a few to general questions regarding the development of Africa.

Geographical Education. *Petermanns M.* **44** (1898): 90–93. ———

Der geographische Unterricht an den deutschen Hochschulen im Sommersemester, 1898.

List of the courses of instruction in geography now being delivered in the German universities.

Geographical Progress. *B.S.G. Paris* **19** (1898): 5–58. **Hulot.**

Rapport sur les travaux de la Société de Géographie et sur les progrès des sciences géographiques pendant l'année 1897. Par M. le baron Hulot. *With Maps.*

This report is daintily illustrated by a series of small sketch-maps of routes.

Geographical Progress. *B.S.G. Paris* **17** (1896): 409–517. **Maunoir.**

Rapport sur les travaux de la Société de Géographie et sur les progrès des sciences géographiques pendant l'année 1895. Par Ch. Maunoir.

Geographical Progress. *B. American G.S.* **30** (1898): 124–126. **Littlehales.**

Recent Advances in Geographic Knowledge, accomplished by the U.S. Hydrographic Office. By G. W. Littlehales.

On the work of the U.S. Hydrographic Office in determining telegraphic longitudes, and in surveying coasts for charts.

Geographical Year-book. **Wagner.**

Geographisches Jahrbuch. XX. Band. 1897. Herausgegeben von Hermann Wagner. Zweite Hälfte. Gotha: Justus Perthes, 1898. Size 9 × 6, pp. 249–510.

In this part, completing vol. XX., Prof. E. Hammer gives a paper on recent progress in cartographic processes; Dr. Hergesell and Dr. Rudolph treat of geophysics; Dr. Tiessin on Asia without Russia; and Prof. Anuchin on Asiatic Russia. Dr. Wolkenhauer gives the customary Necrology, with an index to the obituary notices of the last ten years.

Geography in America. *Science* **7** (1898): 541–551. **Baker.**

A Century of Geography in the United States. By Dr. Marcus Baker.

This paper quotes extracts from American geographical text-books of a hundred years ago, and gives an outline of recent advances towards a complete geographical knowledge of the United States through the various national surveys.

German Colonies. ———

Jahresbericht über die Entwickelung der Deutschen Schutzgebiete im Jahre 1896–97. Beilage zum Deutschen Kolonialblatt 1898. Berlin: E. S. Mittler & Sohn, 1898. Size 12½ × 9, pp. 156.

Travels. **Buxton.**

Short Stalks. Second Series. Comprising trips in Somaliland, Sinai, the Eastern Desert of Egypt, Crete, the Carpathian Mountains, and Daghestan. By Edward

North Buxton. London: Edward Stanford, 1898. Size 9½ × 7, pp. xii. and 226. *Maps and Illustrations. Price* 21*s. Presented by the Publisher.*

In this volume Mr. Buxton describes hunting expeditions in Somaliland, the Carpathians, the Egyptian Red Sea coast, the Sinaitic peninsula, Crete, and Daghestan. There is an important map of Somaliland, showing the new boundaries and much fresh information, and there is also a map of part of the Sinaitic peninsula. The illustrations from the author's photographs are excellent, and the book is a worthy continuation of the first series of 'Short Stalks.'

Year-Book. **Keltie and Renwick.**

The Statesman's Year-book, Statistical and Historical Annual of the States of the World for the year 1898. Edited by J. Scott Keltie, LL.D., with the assistance of I. P. A. Renwick, M.A., LL.B. London: Macmillan & Co., 1898. Size 7½ × 5, pp. xxx. and 1166. *Maps and Diagrams. Price* 10*s.* 6*d. Presented by the Publishers.*

In addition to the careful revision of all the statistical information regarding the countries of the world, this year's issue contains a series of maps and diagrams. The maps show the political condition of the Niger region in Africa, and the distribution of British trade over the world. The trade maps are coloured to show the proportion of British imports to total imports in each country, and only those towns are shown in which there is a British consular or diplomatic representative. The diagrams are modified statistical curves showing the total imports and exports of the principal countries for the last 25 years.

NEW MAPS.

By J. COLES, *Map Curator*, R.G.S.

EUROPE.

England and Wales. **Bartholomew.**

New Reduced Ordnance Survey of England and Wales. Scale 1 : 126.720 or 2 stat. miles to an inch. Sheets: 11, North Wales; 18, Birmingham District; 30, Surrey; 31, Kent. J. Bartholomew & Co., Edinburgh, 1898. *Price* 2*s. each, mounted on cloth. Presented by the Publishers.*

England and Wales. **Ordnance Survey.**

Publications issued since May 8, 1898.

1-inch—General Maps:—

ENGLAND AND WALES:—18, 27, 41, 122, 123, 342, engraved in outline (revision). 1*s.* each.

6-inch—County Maps:—

ENGLAND AND WALES (revision):—**Durham,** 4 S.E., 6 S.E., 7 S.E. **Essex,** 11 N.W., 15 N.W., 16 N.W., N.E., S.W., 19 S.W., 25 N.W., 26 N.W., S.W. 36 N.E., 37 N.W., 38 S.E., 45 N.E., 46 N.E., S.E., 47 N.W., 54 N.W., 69 N.W., 70 S.E., 75 N.W., 80 N.E. **Hampshire,** 21 S.W., 44 S.E., 52 N.E., 65 S.W., 72 N.W., 74 N.W., 76 N.W. **Kent,** 10 S.W., 21 S.E., 33 N.E., 43 N.W., 44 N.W., S.W., 50 S.W., 51 S.E., 52 S.E., 53 N.W., N.E., S.W., S.E., 61 S.E., 62 N.W., S.W., 63 N.E., 64 N.W., S.E. **Northumberland,** 41 N.W., S.W., S.E., 42 N.E., 49 N.E., 50 S.E., 51 S.W., 53 S.W., S.E., 54 S.W., 61 S.W., S.E., 62 S.W., S.E., 63 N.W., N.E., S.W., 64 N.W., 65 N.W., S.W., 66 N.E., 68 S.E., 69 N.E., S.W., S.E., 71 N.E., 72 S.W., 83 N.E., 84 S.W., 89 N.W., 92 N.W., N.E., 103 N.W., S.W., 106A S.E. **Surrey,** 10 N.E., 21 N.E., S.E., 22 N.E., S.E., 24 S.W., 32 N.E., 34 N.W., N.E., 35 N.W. 1*s.* each.

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ENGLAND AND WALES (revision):—**Cheshire,** III. 8, 11, 16; IV. 10; IX. 11; XI. 6; XVII. 14, 15, 16; XVIII. 7, 13; XIX. 1; XX. 10; XXVI. 7, 10, 11, 12; XXVII. 1, 5; XXIX. 13; XXXV. 5, 13; XXXVI. 3; XLI. 12; XLII. 1, 9, 13; XLVIII. 7, 8, 11, 12, 16; XLIX. 2, 9, 11, 12, 13; L. 6; LV. 4, 6; LVI. 1, 4, 10; LVII. 3, 5; LXI. 3; LXII. 2, 4, 6, 7, 8, 9, 13. **Derbyshire,** III. 9; IV. 13; V. 3, 7, 11, 15, 16; VI. 4, 7, 8, 15, 16; VII. 9, 10, 13, 14; IX. 3, 6, 8, 9, 10, 11, 12; X. 1, 2, 3, 4, 6, 7, 8, 10, 11, 15; XI. 9, 13, 14; XII. 10. **Durham,** II. 9, 10. **Essex,** VII. 12. **Hampshire,** LXXV. 15; LXXIX. 10, 14; LXXXIII. 2, 9, 14; LXXXVII. 7, 8, 10; XCIV. 9, 13; XCV. 2, 9; XCVI. 9, 11, 15; XCVII. 1, 6, 7, 8, 12, 16; XCVIII. 1, 5, 6, 9. **Hertfordshire,** II. 13; IV. 11, 15, 16; V. 9, 13, 14; VII. 7, 10, 14; VIII. 4; IX. 1, 16; XI. 4, 7, 10; XIV. 4, 8; XIX. 3, 7; XX. 13; XXI. 15; XXVII. 4, 16; XXVIII. 4, 9, 14; XXIX. 10, 13, 16; XXX. 6, 7, 8, 11,

12; XXXIV. 5; XXXV. 9; XXXVI. 1, 2, 4, 8, 16; XXXIX. 3, 14; XL. 2; XLI. 11; XLIII. 8, 12; XLIV. 7, 8; XLV. 4, 10, 12, 15, 16; XLVI. 1, 5, 9, 13. **Kent,** V. 15; XIX. 9; XXIV. 14, 15; XXVI. 5, 10, 13, 14; XXXIV. 9; XXXVI. 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16; XLVI. 14, 16; XLVII. 10; LXVII. 4, 15; LXXII. 13; LXXV. 1; LXXX. 1; LXXXI. 1, 2, 4, 6, 7, 8, 9, 10, 11; LXXXIV. 1, 5, 6, 10, 16; LXXXVI. 3, 7, 8, 11, 12. **Northumberland,** VIII. 14, 15. **Surrey,** XXIX. 12; XLIV. 4; XLVII. 2. **Sussex,** I. 15; II. 8; III. 2; IV. 4; LX. 16; LXI. 7; LXV. 7, 8, 9; LXVI. 16; LXXIII. 13; LXXIV. 1, 5, 6, 9. **Westmorland,** XXIX. 6, 7, 10, 11, 12, 16; XXX. 5, 6, 7, 9, 10, 11, 13, 14, 15; XXXIV. 7, 15; XXXV. 4, 8, 12, 13; XXXVI. 1, 3, 5, 7, 9, 11; XXXVIII. 3, 4, 6, 7, 9, 10, 11, 12, 13, 15; XXXIX. 2, 3, 4, 5, 8; XL. 1, 5; XLI. 4, 12; XLII. 7, 8, 10, 12, 15, 16; XLVI. 11, 12, 14, 15, 16; XLVII. 6, 7, 9, 14, 15; XLVIII. 2, 6, 9; L. 4; LI. 1. 3*s.* each.

(*E. Stanford, Agent.*)

Harz Mountains. **Bomsdorff.**

O. v. Bomsdorff's Spezial-Karte vom Harz. Scale 1: 100,000 or 1·5 stat. mile to an inch. In 4 sectionen: 1, Oberharz; 2, Thale; 3, Lauterberg; 4, Stolberg. Albert Rathke's Verlagsbuchhandlung, Magdeburg. *Price* 1 *mark each section. Presented by the Publisher.*

London. **Jordan.**

Geological Model of London and Suburbs. By James B. Jordan. The geology compiled from the maps of the Geological Survey. Surveyed principally by W. Whitaker, Esq., B.A., F.R.S. Horizontal scale, 1: 63,360 or 1 stat. mile to an inch; vertical scale, 1: 12,000 or 1 inch to 1000 feet. E. Stanford, London. 1898. *Price* 15*s.*

This is a relief model representing an area of 320 square miles, with London as a centre. It includes the administrative county of London, and extends beyond the county boundary to Finchley on the north, Croydon on the south, St. Mary Cray and Plumstead on the east, and Twickenham and Harrow on the west. The map is geologically coloured, and contains sections, and vertical sections of strata at bore-holes.

The model was originally constructed by Mr. Jordan in contours of cardboard, and reproduced in tinned steel plate. The advantage of this is its superior durability and lightness.

Switzerland. **Menghius.**

Sprachenkarte von Graubünden und Tessin. Nach den Ergebnissen der Volkszählung von 1888. Scale 1: 450,000 or 7 stat. miles to an inch. Von M. C. Menghius. *Petermanns Geographische Mitteilungen,* Jahrgang 1898, Tafel 7. Gotha: Justus Perthes, 1898. *Presented by the Publisher.*

ASIA.

China. **Morse.**

Map of the province of Kwangsi. By H. B. Morse. To accompany Lungchou Trade Report for 1897. *Presented by the Author.*

This map has been compiled from the manuscript map of the Rev. Père Renault, and from the map by T. Piry, French topographic map of Tokin, and Chinese sources. The map is without hill shading, but trade routes are laid down, and the names of places are in Chinese character, with the addition of the names in English of all the principal places.

Shantung. **Reimer.**

Deutschland in Ostasien. Provinz Shantung mit der Kiau-Tschou-Bucht und den Kohlenfeldern von Po-Shan-Hsiën. Scale 1: 750,000 or 11·8 stat. miles to an inch. Berlin: Dietrich Reimer (E. Vohsen), 1898.

AFRICA.

Africa. **Bartholomew.**

Bartholomew's Political Map of Africa. Scale 1: 12,000,000 or 189·3 stat. miles to an inch. J. Bartholomew & Co., Edinburgh, 1898. *Price* 3*s.*, *mounted on cloth. Presented by the Publishers.*

This is a new edition of Bartholomew's Political Map of Africa, which has been corrected and brought up to date, with the exception of the boundary of British Somaliland, as fixed by the Anglo-Ethiopia treaty, July 28, 1897, and consequently territory is shown as British which has been ceded to Abyssinia.

Africa. **Service Géographique de l'Armée, Paris.**

Carte de l'Afrique. Scale 1 : 2,000,000 or 31·1 stat. miles to an inch. Sheets: 53, Windhoek; 54, Vyrburg; 58, Port Nolloth. Service Géographique de l'Armée, Paris. *Price* 1 *fr. each sheet.*

Algeria. **Service Géographique de l'Armée, Paris.**

Carte d'Algerie. Scale 1 : 50,000 or 0·78 stat. mile to an inch. Sheets: 95, Châteaudun du Rhumel; 157, Zemmora. Dressé, heliogravé et publié par le Service Géographique de l'Armée, Paris. *Price* 1.50 *fr. each sheet.*

Matabeleland. **Mitchelson.**

A Mineral Map of Matabeleland. Compiled from original sources by Sydney P. Mitchelson. Published for the Rhodesia Publishing Syndicate, 1898. Scale 1 : 633,600 or 10 stat. miles to an inch. E. Stanford, London, 1898. *Price* £1 1*s.*

Somaliland. **Stanford.**

Map of Western Somaliland. Scale 1 : 1,000,000 or 15·8 stat. miles to an inch. E. Stanford, London, 1898. *Presented by the Publisher.*

This map has been compiled from the route surveys of Major Swayne, R.E., Colonel Paget, Count Hoyos, Dr. D. Smith, Mr. Parkinson, Count Wickenburg, and others, with additions from the itineraries of Mr. Alfred E. Pease, M.P. The boundary of the British Somali Protectorate, 1897, is laid down, and an inset is given, showing the area ceded to Abyssinia by the Anglo-Ethiopia Treaty, July 28, 1897.

West Africa. **Stanford.**

A Map of part of West Africa, including the Gold Coast, Lagos, the Niger Coast Protectorate, and part of the Royal Niger Company's Territory, 1898. Scale 1 : 1,900,800 or 30 stat. miles to an inch. E. Stanford, London, 1898. *Presented by the Publisher.*

This map includes the west coast of Africa from the eastern portion of the Ivory Coast to the old Calabar river, and the country inland as far as 14° 20′ N.

AMERICA.

British North-West America. **Surveyor-General's Office.**

Canadian Government Surveys: Yukon Map. Scale 1 : 380,160 or 6 stat. miles to an inch. Sheets 2, 3, 4, 5, 6, 7, 8, 9, 10. Surveyor-General's Office, Ottawa, 1898. *Price* 25 *cents each sheet. Presented by the Surveyor-General of Canada.*

These sheets of the Canadian Government Survey include the Yukon goldfields and the country between them and the west coast. The area embraced commences at the mouth of the Stikine river, and the west line is followed to Yakutat bay and the slopes of the Mount St. Elias range; then it follows the 149th meridian to lat. 66° 20′ N., thus including the Klondike region. To the east these sheets include the lakes and upper waters of the Yukon and Pelly rivers, numerous heights are given, and all the trails are laid down.

As these sheets contain the results of actual survey, and are drawn on the scale of 6 miles to the inch, they will be of great service to all who are visiting the Klondike region, but especially to those who are using any of the west coast routes.

Canada. **Stanford.**

Stanford's General Map of the Dominion of Canada and Newfoundland. Scale 1 : 5,274,720 or 83·2 stat. miles to an inch. E. Stanford, London, 1898. *Presented by the Publisher.*

Cartagena. **Hart.**

Plan of the City of Cartagena, showing the location of the Tracks, Buildings, and Wharves of the Cartagena Terminal and Improvement Co., Ltd., and Cartagena-Magdalena Railway Co. Scale 1 : 9,820 or 1 inch to 0·155 stat. mile. By F. R. Hart. 1898. *Presented by the Author.*

United States and Spain. **Bartholomew.**

Bartholomew's Spanish-American Special War Map. North Atlantic, United States, Spain, and Cuba. With inset maps of Havana and other chief ports. New Edition. J. Bartholomew & Co., Edinburgh, 1898. *Price* 1*s.* 6*d. on cloth. Presented by the Publishers.*

AUSTRALASIA.

New Guinea. **Petermanns Geographische Mitteilungen.**

Der Untere Bubui mit der Missionsstation Simbang. Scale 1 : 40,000 or 0·63 stat. mile to an inch.—Die Tami (Crétin) Inseln vor der No. Ecke des Huon-Golfes.

Scale : 20,000 or 0·31 stat. mile to an inch. *Petermanns Geographische Mitteilungen*, Jahrgang 1898, Tafel 8. Langhans' Beiträge zur Kenntnis der Deutschen Schutzgebiete Bl. 11. Gotha: Justus Perthes, 1898. *Presented by the Publisher.*

CHARTS.

Admiralty Charts. **Hydrographic Department, Admiralty.**

Charts and Plans published by the Hydrographic Department, Admiralty, during March and April, 1898. *Presented by the Hydrographic Department, Admiralty.*

No.	Inches.	
850	m = 9·4	North Holland:—Ymuiden harbour. 1*s.* 6*d.*
2994	m = 1·75	Great Belt:—Sprogö to Omö. 2*s.* 6*d.*
2989	m = 4·95	France, west coast:—Entrance to the Loire river, and approaches to St. Nazaire. 2*s.* 6*d.*
2990	m = 4·9	France, north coast:—Le Havre and entrance to the Seine. 2*s.* 6*d.*
1660	m = 0·5	Greece:—Gulf of Corinth. 2*s.* 6*d.*
2963	d = 4·1	Arctic Russia:—Gulf of Ob (Obskoi Gubi), and gulf of Yenesei (Yenesciskago Saliva). 2*s.* 6*d.*
1535	m {= 7·2 / = 2·17}	Plans on the east coast of Iceland:—Seidis fiord, Nord, Hellis, and Vid fiords. 1*s.* 6*d.*
1531	m = var.	Anchorages in the strait of Belle isle:—Black bay, Pinware bay, Anse à Loup. 1*s.* 6*d.*
1534	m = 5·9	Newfoundland, east coast:—Western or Hauling arm. 1*s.* 6*d.*
2961	m = 1·2	Lake Ontario:—Eastern part of the Bay of Quinté, Kingston to Deseronto. 2*s.* 6*d.*
1524	m = var.	Plans in Alaska:—Juneau anchorage, Wrangell harbour, Ratz harbour, Tongass narrows, Tolstoi bay. 1*s.* 6*d.*
1291	m = {1·1 / 1·9}	Anchorages on the west coast of Africa:—Sette Cama anchorage, Lendana bay. 1*s.* 6*d.*
2987	m = 0·73	Philippine islands:—San Pedro bay to Libukan islands, including Juanico strait. 2*s.* 6*d.*
2974	m = 1·0	China, east coast:—Chang-tau harbour and approaches. 1*s.* 6*d.*
2995	m = 4·0	South Pacific ocean:—Suloga harbour (Woodlark island). 1*s.* 6*d.*
1512	m = 1·0	New Zealand:—Anchorages on and off the north coast of North island:—Three Kings islands, Port Mangonui. 1*s.* 6*d.*
215	d = 2·95	Pacific ocean:—New Caledonia Isle of Pines, to New Zealand North cape. 2*s.* 6*d.*
2283	d = 2·88	Pacific ocean:—Tongatabu island to L'Esperance rock. 2*s.* 6*d.*
1660	m = 3·0	Fiji islands:—Suva harbour. 2*s.*
2971	m = var.	North Pacific ocean:—Fanning island, English harbour, Whaler anchorage. 2*s.* 6*d.*
2399		Gulf of Pyrgos or Burghaz:—Plan added, Messemvria to Cape Emineh.
1936		Plans in the North Pacific ocean:—New plan, Roca Partida, plans added, San Benedicto island, Malpelo island.
724		Islands and reefs between Seychelles and Madagascar:—Plan added, Coetivey island.

(*J. D. Potter, Agent.*)

Charts Cancelled.

No.	Cancelled by	No.
850 Ymuiden harbour.	New Chart. Ymuiden harbour	850
2646 Plan of entrance to Loire river on this sheet.	New Sheet. Entrance to the Loire river and approaches to St. Nazaire	2989
1600 Gulf of Corinth, or Lepanto.	New Chart. Gulf of Corinth	1600
1791 Port Monganui.	New Chart. Anchorages on and off the north coast of North island	1512
2867 Plans of Fanning island and English harbour on this sheet.	New Chart. Fanning island, English harbour, Whaler anchorage	2971

Charts that have received Important Corrections.

No. 2057, Ireland, west coast:—Westport bay. 124, Netherlands:—The Texel. 2269, White sea:—Cape Cherni to Mount Sozonova. 2276, White sea:—Bouin point to Sharapov head. 2273, White sea:—Nikodimskoi and Intsi points to Kammenoi point, etc. 2302, Gulf of Bothnia:—Tome point, round the head of the gulf to Tauvo. 696, Germany:—Kiel harbour. 2714, Portugal, west coast:—Port Setubal. 2835, Black sea:—Delta of the Danube, etc. 2232, Black sea:—Odessa to Sevastopool. 2230, Black sea:—Bosphorus to Cape Kaliakra. 2234, Sea of Azov. 1645, Asia Minor:—Island of Khios and Gulf of Smyrna. 369, plans in the Cape Verde islands. 2240, Iceland:—Approach to Grundar and Kolgrafa fiords. 2172, Bering strait. 282, Newfoundland:—St. John bay to Orange bay and strait of Belle isle. 2902, Newfoundland, east coast:—Motion head to Flat rock point, showing the approaches to St. John's harbour. 1731, Lake Huron:—Parry sound and approaches. 330, North America:—Lake and River St. Clair, with the Detroit river. 1441, West Indies:—Turks islands. 2044, South America, east coast:—Ilha Grande and Sapetiba bays. 23, Chile:—Channels between Magellan strait and Gulf of Trinidad. 24, Chile:—Channels between Gulf of Trinidad and Gulf of Peñas. 572, British Columbia:—Constance cove. 1503, Alaska:—Kadiak island to Siguam island. 1499, Alaska:—Cross island to Kadiak island. 397, Africa, west coast:—River Volta, etc. 1360, Africa, west coast:—Barako to Cape St. Paul. 1713, Africa, west coast:—Anchorages on the west coast of Africa. 1456, Africa, west coast:—River Cameroon, with the Ambas islands. 7, Gulf of Aden:—Aden and adjacent bays. 828, Bay of Bengal:—Cape Comorin to Cocanada. 2761, Sumatra, west coast:—Tyingkok bay to the Strait of Sunda. 941B, Eastern Archipelago, western portion, etc. 895, plans of anchorages in Bali, Lombok, etc. 2637, Strait of Makasser, south part. 2194, plans of anchorages in the north part of Celebes. 930, Anchorages between Borneo and New Guinea. 989, China sea:—Lakon roads to Lem Tane. 2725, Gulf of Siam:—Koh Tron and channels leading to anchorages off Kamput. 2062, Cochin China:—Tong King gulf. 1961, Pescadores islands. 2376, Harbours in Formosa. 2809, Yang-tse Kiang:—Shanghai to Nanking. 2347, Japan:—Nipon, Kiusiu, and Shikoku, etc. 2441, Japan:—Tsugaru strait. 2432, Tartary:—Tumen Ula to Strelok bay, etc. 2759A, Australia, northern portion, etc. 2766, North-east coast of New Guinea, etc. 780, Pacific ocean:—South-west sheet. 1829, Pacific ocean:—Fiji islands to Samoa islands. 1830, Pacific ocean:—Ellice islands to Phœnix islands. 767, Tuamotu or Low archipelago and the Society islands. 2867, Islands and anchorages in the North Pacific ocean.

(*J. D. Potter, Agent.*)

United States Charts. **U.S Hydrographic Office.**

Pilot Charts of the North Atlantic and North Pacific Oceans for May and June, 1898. Published at the Hydrographic Office, Washington, D.C. *Presented by the U.S. Hydrographic Office.*

GENERAL.

The World. **Vivien de Saint Martin and Schrader**

Atlas Universel de Géographie. Ouvrage commencé par M. Vivien de Saint Martin et continué par Fr. Schrader. Paris: Librarie Hachette et Cie. Sheets 76 and 76 bis. *Price 2 fr. each sheet.*

The World. **Andree.**

Andrees allgemeiner Handatlas, 126 Haupt- und 130 Nebenkarten auf 186 Kartenseiten, nebst alphabetischen Namenverzeichnis. Vierte, völlig neubearbeitete, stark vermehrte Auflage, herausgegeben von A. Scobel. Bielefeld und Leipsig: Verlag von Velhagen & Klasing, 1898.—Lief 12, Uebersichtskarte von Österreich-Ungarn, Westrussland, Südlicher Teil.—Lief 13, Ost-Frankreich: England und Wales, Nördliche Hälfte.—Lief 14, Isobaren und Winde im Januar und Juli. Niederschlagsmengen Jahreszeitliche Verteilung der Niederschläge: Schweden und Norwegen, Südlicher Teil.—Lief 15, Untere Donauländer und Türkei, Ostliche Halfte: Nordöstliches Afrika.—Lief 16, Isothermen der Luft im Januar, Juli und Jahresdurchschnitt. Linien Gleicher Mittlerer Jährl. Wärmeschwankung: Verkehrskarte der Nord- und Ostsee.

World. **Bartholomew.**

The Citizen's Atlas. One hundred maps and gazetteer. By J. G. Bartholomew, F.R.G.S. Published by George Newnes, Ltd., London. To be completed in 20 parts. Parts 1 to 8. *Price 6d. each.*

Eight parts of this atlas have already appeared, and it is to be completed in twenty parts issued fortnightly. The plates of which it is composed, are those of Bartholomew's

"Library Reference Atlas," corrected and brought up to date. The maps are very clearly drawn, and, at the price it is now offered, it is a remarkably cheap atlas.

PHOTOGRAPHS.

British Central Africa. **Weatherley.**

126 Photographs of British Central Africa, taken by Poulett Weatherley, Esq. *Presented by Poulett Weatherley, Esq.*

Owing to Mr. P. Weatherley's absence from England, the titles of these photographs have not been furnished. They, however, include photographs of scenery and natives, taken chiefly in the neighbourhood of Lake Bangweulu, and have been admirably produced from Mr. Weatherley's negatives by the Stereoscopic Company.

Central Africa. **Crawford.**

Fourteen Photographs of Garenganze Country, Lake Mweru District, etc., taken by Mr. D. Crawford. *Presented by F. S. Arnot, Esq.*

This interesting set of photographs contains a series of subjects which have been well chosen to convey an idea of the scenery and native life of this part of Africa. The following is a list of the titles:—

(1) Vasera (fisher tribe), Lake Mweru; (2) Vasera chief, Lake Mweru; (3) Building missionaries' house, Luanza, free labour; (4) Vasera chief and wives, Lake Mweru; (5) Johnston Falls, Luapula river, looking south; (6) Missionaries' first camp, on site of Johnston Falls Sta., Luapula river; (7) Livingstone's tree, Ilala, fenced round by Mr. and Mrs. Crawford; (8) Livingstone's tree, Ilala; (9) Uluba woman, Lualaba river, side view; (10) Uluba woman, front view; (11) Usera chief and wives, Lake Mweru (12) Mr. Pomeroy and Katanga natives; (13) Mr. Garman and Katanga natives; (14) Mwena Mission Station, Lufira valley, Garenganze country, or Katanga.

Colombia. **Hart.**

Album containing 38 photographs of the neighbourhood of Cartagena, Republic of Colombia, taken by F. R. Hart, Esq. *Presented by F. R. Hart, Esq.*

The following is a list of the contents of this album:—

(1) Palace of Justice and ruined church; (2) Street scene; (3) Plaza Rafael Nuñez; (4) In the outskirts of the city; (5) Between the wall and the houses; (6) The wall towards the sea; (7) A part of the walls; (8) On top of the walls; (9) Convent of La Popa and fortress of San Felipe; (10) House of the late president, Dr. Nunez; (11) Gateway to fort at Boca Chica; (12) Top of fort at Boca Chica; (13) Bridge (Puenta Media Luna) connecting the city with the mainland; (14) Railway shops at Cartagena; (15) Engine house; (16) Car shops; (17) Interior of car shops; (18) Interior of machine shop; (19) Storehouse for railway supplies; (20) Between Cartagena and Turbaco (Coral ballast); (21) Between Cartagena and Turbaco (cattle country); (22) Between Cartagena and Turbaco (entrance to plantation of Santa Ysabel); (23) Between Cartagena and Turbaco (cut near summit); (24) Station at Arjona; (25) Trestle between Turbaco and Arjona; (26) Cut between Arjona and La Viuda; (27) Tracks through plantation of La Viuda; (28) Clearing on La Viuda; (29) The first settlement at La Viuda; (30) La Viuda twenty months afterwards; (31) La Viuda, overseer's house; (32) Young bananas at La Viuda; (33) Banana plants at La Viuda about eighteen months old; (34) Trestle near Soplaviento; (35) Magdalena river at Calamar; (36) Magdalena river-boat; (37) Interior of steamboat *M.A. Caro;* (38) "Rhode island," 38-ton locomotive.

Mount St. Elias Range. **Bryant.**

Panorama of the Mount St. Elias Range, Alaska, in two parts, taken by Prof. H. G. Bryant, M.A., LL.B., 1897. *Presented by Prof. H. G. Bryant.*

N.B.—It would greatly add to the value of the collection of Photographs which has been established in the Map Room, if all the Fellows of the Society who have taken photographs during their travels, would forward copies of them to the Map Curator, by whom they will be acknowledged. Should the donor have purchased the photographs, it will be useful for reference if the name of the photographer and his address are given.

THE NORTH-WESTERN PART

Reduced from a Map published

RT OF THE DOMINION OF CANADA.

ned by the Surveyor-General, Ottawa, 1898.

Continuation of Map on half scale

English Miles

0 50 100 200 300

Natural Scale 1: 8,000,000 or 1 inch=126·26 miles

64
62
60
58
56
54
138
136
134
132
130
128
126
ALASKA
UNEXPLORED
DISTRICT
MACKENZIE
DISTRICT
BRITISH
COLUMBIA
PACIFIC
OCEAN
NORTH
Fort Reliance
DAWSON
Klondike River
Mayo L.
Mt. Jesus
Ogilvie
Stewart River
Fraser Falls
100 to 200 ft. high
L. Kalzas
Macmillan River
Fort Selkirk
(ruins)
Wellesley L.
White River
Tahte R.
Hewes
Five finger Rapid
Ross R.
Fort Norman
R.C. Mission
C.M.S. Mission
Simpson Cr.
Careajou R.
Pelly Lakes
North Nahanni
Mt. Pherson L.
L. Finlayson
L. Frances
Fort Frances (site of)
Upper Liard R.
Lower Post
Blue R.
Dease R.
Fort Halkett
Centreville
Sylvester Landing
Laketon
Dease Lake
Telegraph Cr.
Stikine River
Scud R.
Porcupine R.
Iskut River
Third South Fork
Stikine R.
Fort Wrangell
Unuk R.
Ootsabankut L.
Fort Connelly
Hazelton
Morricetown
Babine Lake
North Tacla L.
Fort Simpson
Port Essington
Skeena R.
Nass R.
Portland Canal
Revilla Gigedo I.
Dall I.
Graham I.
Queen Charlotte Is.
Dixon Entrance
Hecate Chan.
Dundas Is.
Mt. Logan
19,539
Mt. St. Elias
18,024
Kluahne Lake
Kluahne R.
Mishihik L.
Nordenskiold R.
Hutshi L.
Teslin (Hootalinqua R.)
Big Salmon R.
Little Salmon R.
L. Labarge
Kaskawulsh R.
Alsek River
Dalton's Post
Dezadeash L.
Klukshu L.
Kusawah L.
Takhini
Police Post
Whitehorse Rapid
Mc Clintock
Mc Clintock portage
Marsh L.
Police Post
Bennett
L. Mazeah
Atlin Lake
Teslin Lake
Nisutlin R.
Mc Dame Cr.
Mc Therson R.
Upper Liard R.
Frances River
Yakutat Bay
Taylor Bay
Chilkat R.
Chilkoot Pass
White Pass
Dyea
Skaguay
Takhin R.
Lynn Canal
Glacier Bay
Cross Sound
Juneau
Chichagof Island
Kruzof I.
Sitka
Sitka Sd.
Baranof I.
Kuiu I.
Kuiukof I.
Frederick Sd.
Christiana Sd.
Prince of Wales Island
Clarence Str.
Chatham Str.
Peril Str.
Sumner Str.
Wrangell Narrows
Portland Canal
Ernest Sound
Behm Canal
Gardner Canal
Kitlope R.
Kemano R.
Nanaimo R.
Lac des Francais
Babine R.
Bulkley R.
Zymoetz R.
Morrice R.
Kitseguecla R.
Hagwilgate R.
Hogsell R.
Granville Chan.
Bentinck I.
Pitt I.
Tatsenshini R.
Alsek R.
Takhanne R.
Klukshu R.
Chilkat R.
Slowoh R.
Nahlin R.
Inklin R.
Tuya R.
Tahltan R.
Tanzilla R.
Klastine R.
Nahlin R.
Nahlin R.
Kechika R.
Liard R.
Coal R.
Smith R.
Beaver R.
Ingenika R.
Finlayson R.
Main Br.
Ross R.
Little Salmon R.
Big Salmon R.
Hootalinqua R.
Nordenskiold R.
Klukshu R.
Dezadeash L.
Kusawah L.
Takhini
Mile Canon
Mc Clintock
Whitehorse Rapid
Police Post
Marsh L.
Bennett
Healy L.
Takhini R.
Takhini
Chilkat R.
Chilkoot Pass
White Pass
Dyea
Skaguay
Takhanne R.
Klukshu R.
Tatsenshini R.
Alsek River
Dalton's Post
Kaskawulsh R.
Kluahne R.
Kluahne Lake
Mt. Logan
19,539
Mt. St. Elias
18,024
Wellesley L.
White River
Tahte R.
Donjek R.
Aishihik L.
Aishihik R.
Hutshi L.
Nordenskiold R.
Little Salmon R.
Big Salmon R.
Hootalinqua R.
Teslin (Hootalinqua R.)
L. Labarge
Klukshu R.
Dezadeash L.
Kusawah L.
Takhini
Police Post
Whitehorse Rapid
Mile Canon
Mc Clintock
Mc Clintock portage
Marsh L.
Police Post
Bennett
Healy L.
L. Mazeah
Atlin Lake
Teslin Lake
Nisutlin R.
Takhini R.
Takhini
Chilkat R.
Chilkoot Pass
White Pass
Dyea
Skaguay
Takhanne R.
Klukshu R.
Tatsenshini R.
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Little Salmon R.
Big Salmon R.
Hootalinqua R.
Teslin (Hootalinqua R.)
L. Labarge
Ross R.
Main Br.
Pelly Lakes
Finlayson R.
L. Finlayson
L. Frances
Fort Frances (site of)
Upper Liard R.
Frances River
Mc Therson R.
Nisutlin R.
Teslin Lake
Atlin Lake
Lower Post
Blue R.
Dease R.
Coal R.
Smith R.
Fort Halkett
Mc Dame Cr.
Centreville
Sylvester Landing
Laketon
Dease Lake
Telegraph Cr.
Stikine River
Scud R.
Porcupine R.
Iskut River
Third South Fork
Stikine R.
Fort Wrangell
Unuk R.
Ootsabankut L.
Fort Connelly
Hazelton
Morricetown
Babine Lake
North Tacla L.
Fort Simpson
Port Essington
Skeena R.
Nass R.
Portland Canal
Revilla Gigedo I.
Dall I.
Graham I.
Queen Charlotte Is.
Dixon Entrance
Hecate Chan.
Dundas Is.
Careajou R.
Simpson Cr.
Fort Norman
R.C. Mission
C.M.S. Mission
Mayo L.
Mt. Jesus
Ogilvie
Stewart River
Fraser Falls
100 to 200 ft. high
L. Kalzas
Macmillan River
Fort Selkirk
(ruins)
Wellesley L.
White River
Tahte R.
Hewes
Five finger Rapid
Ross R.
Pelly Lakes
North Nahanni
Mt. Pherson L.
L. Finlayson
L. Frances
Fort Frances (site of)
Upper Liard R.
Lower Post
Blue R.
Dease R.
Fort Halkett
Centreville
Sylvester Landing
Laketon
Dease Lake
Telegraph Cr.
Stikine River
Scud R.
Porcupine R.
Iskut River
Third South Fork
Stikine R.
Fort Wrangell
Unuk R.
Ootsabankut L.
Fort Connelly
Hazelton
Morricetown
Babine Lake
North Tacla L.
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Port Essington
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Nass R.
Portland Canal
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Hecate Chan.
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Careajou R.
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Fort Norman
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100 to 200 ft. high
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Five finger Rapid
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Pelly Lakes
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Laketon
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Porcupine R.
Iskut River
Third South Fork
Stikine R.
Fort Wrangell
Unuk R.
Ootsabankut L.
Fort Connelly
Hazelton
Morricetown
Babine Lake
North Tacla L.
Fort Simpson
Port Essington
Skeena R.
Nass R.
Portland Canal
Revilla Gigedo I.
Dall I.
Graham I.
Queen Charlotte Is.
Dixon Entrance
Hecate Chan.
Dundas Is.

English Miles
10 0 50 100 200

Natural Scale 1:4,000,000 or 1 Inch = 63·13 miles

Published by the Roy

BERING SEA

GULF OF ALASKA

BRISTOL BAY

ALASKA PENINSULA

KENAI PENINSULA

Alaska Mountains

Cook's Inlet

Shelikof Strait

C. Romanzof

Andreafski

Kotzebue

Kaiyuk

Kolichavak R.

Okhagamut

Nelson I.

Nunivak I.

Bethel

Kuskokwim R.

Etolin Str.

Tikchik

Malchatna R.

L. Clark

Iliamna

Kogiung

St Alexander

Kuluk R.

Ukak

Augustin I.

Barren Is

C. Elisabeth

Afognak I.

Marmot I.

St Paul

Kadiak I.

Trinity Is

Montague I.

William St

Kayak I.

Yakutat

Copper R.

Suschina R.

Tanana R.

Chitina R.

White

Klutlahne L.

Mt Logan

Mt St Elias

Continuation of Map on half scale

English Miles

0 50 100 200 300

Natural Scale 1: 8,000,000 or 1 inch=126·26 miles

165 160 155 150 145

64 62 60

Fort Simpson
C.M.S. Mission

Rabbit Skin R.

Spence R.

Horn Mt

Pt Providence

GREAT SLAVE LAKE

Pt Resolution
R.C. Mission
C.M.S. Mission

MACKENZIE R.

S. Nahanni R.

Trout R.

Yellowknife R.

Beaver R.

Lit. Salmon R.

SLAVE RIVER

Fort Liard

Black River

Hay River

Pt Smith
R.C. Mission

ATHABASCA

Pt Chipewyan

L. Claire

Old Fort R.

Nelson Snake R.

Sicannie R.

Fort Nelson

Pt Vermilion

Red River

Birch Mountain

Buffalo Head Hills

Loon R.

Peace R.

Clearwater R.

Pembina R.

Pt McMurray

Sicannie (Chief River)

East Branch Pine River

Clear Hills

Halfway River

Pine River

Battle R.

Cadotte R.

White Mud R.

Trout R.

Bear R.

Fort Grahame

Pt St John

Peace R. Landing
H.B.Co

Meslinca R.

Ospinca R.

Hudsons Hope

Dunvegan

Kiskatinaw R.

Burnt R.

Smoky R.

Beaver Lodge R.

Wapiti R.

Omenica R.

New Hogem

Nation R.

Parsnip R.

Pine R.

Mt Selwyn

Sturgeon L.

Lesser Slave Lake

Lesser Slave R.

Pt Vermilion
H.B.Co

Athabasca Landing
H.B.Co

La Biche R.

La Biche
R.C. Mission

Pt Assiniboine

Victoria

Saskatchewan R.

Edmonton

Peace R.

Athabasca R.

Lesser Slave R.

Peace River Wagon Road

Pt St James

Stuart L.

Fraser R.

Pt George

Quesnel

Blackwater R.

Mud R.

Willow R.

Bear R.

Grand Fork

Snake Indians R.

Beaver R.

Red Willow R.

Smoky R.

Swamp R.

North Fork

S. Br. of North Fork

South Fork of Fraser River

Lower Bechacco R.

Endako R.

Nation Lake

Kuzkwa R.

Grooked R.

Salmon R.

Kitimaat R.

Pt Fraser

Killet

Wetaskiwin

Ponoka

Beaver R.

Lesser Slave R.

Peace R.

Athabasca R.

Mt Brown

Brazeau R.

124 122 120 118 116 114 112

58 56 54

Lithographed by W. & A. K. Johnston Edinburgh & London.

e Royal Geographical Society

45 10′ 20′

AHL YEZID

YAFEI AL ALIYA
UPPER YAFEI

J.al Kara

J. Shaib

Jal Ahmar

40′

Wadi Gehir

W. Serrar

Mishiat

J.Leswa

Wadi

Hait Manwai

Ar Rikab

J.am Bada

W. Theba

J.al Khalle

J. Melbait 7000

HAMUMI PASS

W. Kaus

WADI BANNA OR BENNA

Y

A

30′

Wadi Jhani

J. Amand

J.Kashur

J. Masaida

Wadi Theba

Jebel Rusaif

Mawa

YAFEI FORTS

WADI HASSAN

Al Ma'a

W. Kaus

HABL BARRIK

RADKAN RANGE

J.Gheresh

GODDA

20′

Al Masara

Jebel Logheran

Tal Kaka

F

Al Haiga

FADHLI

Abr Shebba

Al Husn

Dirgheg

A

J. Sarrar
(Ruins)

J. Gabeil
2 Forts

Al Kara
1100

Al Jadi

WADI HASSAN

Harur

Khanfar

Teran
el Kaur

WADI BANNA

10′

Hagheri
Ash

Amudiya

Al Khabt

Al Harba

Bir Mighar

Al Kud

Sheikh Abdulla

Al Kuwais

Ras Seilan

From Sheikh Otsman

13°

45°10′ 20′

Published by th

THE FADHLI COUNTRY
SOUTH ARABIA

From a sketch survey by

THE LATE J. THEODORE BENT ESQ.

1897.

Scale of Miles

0 5 10

Natural Scale 1: 250,000 or 1 inch = 3·9 miles.

Route ~~~

30′ 40′ 50′

40′ 20′ 10′ 13′

by the Royal Geographical Society.